Norwegian School of Economics
Bergen, Fall, 2022

Does Private Ownership in the Kindergarten Sector Benefit the Children? Empirical Evidence from Norway

Does the kindergarten's ownership form impact the quality?

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Master Thesis, Economics and Business Administration, Financial Economics

NORWEGIAN SCHOOL OF ECONOMICS

This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Please note that neither the institution nor the examiners are responsible − through the approval of this thesis − for the theories and methods used, or results and conclusions drawn in this work.

Executive Summary

This paper investigates whether private ownership in the Norwegian childcare sector benefits children. The paper seeks to do so by investigating whether there are differences in quality between public and private kindergartens, both in terms of structural and process quality.

The Norwegian government has an overarching goal to provide quality kindergarten services to everyone. In the past 20 year the his sector has seen a great increase in activity by private companies, and the past ten years have caused a great level of consolidation together with some PE activity, generating a great level of debate between the political flanks in Norway on the involvement of private companies in welfare services. Norwegian ordinary kindergartens are the ideal setting to analyse, given the close to even split between public and private facilities and public grants to encourage wide use of the services.

When comparing the means of key structural indicators, we can conclude that public kindergartens significantly outperform their private peers. The same comparison of process quality indicators shows the opposite result: private outperform public kindergartens. When looking closer at different types of private kindergartens, we see a significant outperformance by independent facilities over the largest groups and PE-owned facilities on all quality measures.

When analysing the effect of private ownership using a fixed-effect regression on key structural quality indicators, we cannot see any clear outperformance in terms of structural quality between public and private facilities when controlling for time effects and adding facility level and socioeconomic control variables. The same analysis shows a significant relationship between private ownership and process quality indicators. Further, we find that independent kindergartens significantly outperform other private kindergartens, while the more commercial ones perform on par with public facilities. We further find that size, opening hours and location are factors that greatly impact parental satisfaction.

Since process quality is the main objective, private ownership benefits the children, but we cannot conclude that ownership impacts quality. The latter cannot be concluded as we see such large variations between private facilities, and private ownership is merely an indicator of other underlying trends, such as facility adaptability, work environment and teaching methods.

Acknowledgements

This master's thesis concludes my Master of Sciences in Economics and Business Administration at the Norwegian School of Economics.

I want to take a moment to thank and express my gratitude to my thesis supervisor Prof. Carsten Bienz. His feedback, thought-provoking discussions and perspectives have been invaluable for completing this thesis. Further, I would like to express my gratitude towards Eiendomsverdi for providing me access to their real-estate data.

Lastly, I would like to thank my partner, family and friends who have contributed with support and as sparring partners.

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1. Background and Research Question

The market for private welfare service providers in Norway has divided the Norwegian political spectrum over the past decade. One of the drivers of this debate is the possibility for private companies to make a profit by taking care of the most vulnerable in society. This is especially true when it comes to welfare services related to toddlers. A child's first years are the most critical for its development, and *early childhood education and care* (ECEC) plays a vital role in children's development, learning, and well-being (OECD, 2019). A research group with James Heckman, Nobel laureate in economics, finds that high-quality ECEC significantly benefits society and largely outweighs its cost (García, Heckman, Leaf, & Prados, 2016). In fact, when researching the life-cycle benefits of a high-quality birth-to-five-year ECEC program, it delivers a 13% ROI per annum for every dollar invested in childcare for disadvantaged children. It is not only for disadvantaged children that investing in high-quality ECEC programs pays off; it has a lasting effect on IQ, academic, and economic achievements and prevents chronic diseases and obesity in adulthood (Elango, García, Heckman, & Hojman, 2015).

ECEC plays a crucial role in the community in Norway as 92.8% of children aged 1-5 attends a kindergarten either full or part-time in 2020 (Statistics Norway, 2021), and their role has grown in importance over the past decades. To indicate the magnitude of the increased importance, the percentage of children attending kindergarten in the year 2000 was only 62%. Not only are more children attending kindergartens, but they are also staying longer; in the year 2000, 63% of all children had a full-time place versus more than 97% in 2017 (Stabell, 2017). Since the year 2000, more children have started attending *privately owned kindergartens* (private kindergartens), and today it is approximately equally divided between private and *municipal kindergartens* (public kindergartens). Of the more than 5500 kindergartens in Norway, more than half are private.

With the increasing number of children attending private kindergartens and the importance of ECEC in Norway, the ownership form has become a hot topic for debate. One of the main arguments against private kindergartens is that their owners are more concerned about their bottom line than providing quality service to children. However, the counterargument is that private kindergartens offer more choice and flexibility for parents. The debate about kindergartens has become a divisive topic on the political spectrum as it is one of the core

arguments separating the left from the right. At the heart of the debate is the ability for welfare providers, such as kindergartens and retirement homes, to make a profit and take out dividends. This creates discussions because the private kindergartens in Norway are largely fully financed by the public over the tax bill. In 2019, private kindergartens received NOK 22.1 billion in public grants, while parental payments accounted for shy of NOK 4 billion (Haraldsrud, 2020). Hence, the political question is, given that the taxpayers finance kindergartens is it acceptable for private kindergartens to take dividends instead of using the profits to improve their services?

The Norwegian law and kindergarten Act regulates private kindergarten's ability to pay out dividends. However, public opinion questions the law when private kindergartens circumvent the dividend regulations and use public funds and parental payments to finance holiday apartments in Spain or expensive ski-in-ski-out cabins at Norwegian ski resorts (Jelstad, 2017). This method even works for companies having a non-profit clause in their statutes. Hence, it strengthens the argument that the owners of private kindergartens' main concern is making money instead of spending the funds on providing an environment for the children to play and develop. The left side of the political spectrum has coined a term to describe the behaviour of private companies that profit from delivering welfare services funded by the public, *welfare profiteers*. This argument may not seem as farfetched when we see "public-funded" private companies purchasing real estate on Costa del Sol. Of the NOK 1.1 Bn in total results for private kindergartens in 2018, 10.3% and 21.4% were taken as dividends or transferred to the mother company, respectively. In fact, a report by the auditing and consulting firm BDO stated that the return on equity for investments in private kindergartens was three times higher than the main index at the Oslo Stock Exchange in the period 2007-2016, 28,3% versus 8.4% (BDO, 2018). Higher risk often explains higher returns; however, BDO considers the risk low financially and politically. Given these results, one might start to question the intentions of private ECEC providers and whether they seek to provide the right environment for care, play and development for children.

When looking at the supporters of private kindergartens they see public kindergartens as the problem. They point to parents are pleased with the private kindergartens and that public kindergartens are not running efficiently. Agenda Kaupang (2021) has written a report on behalf of the *private kindergartens' association* (PBL) and found that the public saves NOK 2.3 billion per year by using private kindergarten providers. The supporters of private

kindergartens argue that as long as the profit arises from efficient operations and the quality requirements are met; a reasonable dividend is unproblematic. PBL's counterargument to those who believe its members are welfare profiteers is that more than one-third of the private kindergartens are in the red, and this fraction has been increasing (PBL, 2020). They argue that margins are declining, limiting their ability to work on long-term quality development.

Given the ongoing debate, which has lasted over a decade, I find it interesting to analyse whether private kindergartens deliver higher or lower quality than their public counterparts. This is highly relevant as the primary policy focus of the government is to provide quality ECEC for all. Further, if there is a discrepancy in quality, where does it arise from, does the difference in quality arise from the kindergarten or the environment it operates in? Therefore, the research question for this paper is:

"Does the kindergarten's ownership form impact the quality?"

To answer this question, this thesis will examine the ECEC sector in Norway and the dynamics between private and public kindergartens. This part will look at the creation, organisation, and financing of private kindergartens. The next chapter will look at the literature and theoretical framework which will be applied, mainly about the governmental control mechanisms and existing research on quality in kindergartens.

Chapter four will look at the data used in the analysis and its adjustments to fit into the methodology. The fifth chapter will examine if there are any differences in quality between private and public facilities, and if they are affected differently by legislative change and how they translate this into process quality. The sixth chapter will look at whether these quality changes arise from ownership form or any other indicator.

2. Norwegian Kindergartens

2.1 About Kindergartens

The Norwegian Kindergarten Act (The Norwegian Ministry of Education and Research, 2020) states that kindergartens must be pedagogical facilities for children and promote development while safeguarding the child's need for play. In 2021 268,465 children attended one of the 5,525 Norwegian kindergartens (Statistics Norway, 2022). The share of public kindergartens was 47%, and the remainder were private. We note a decrease in the number of kindergartens and children in kindergartens in the past five years from SSB's numbers. However, while the ratio between private and public kindergartens has remained somewhat constant, we notice that the average kindergarten has increased in size from 47.3 children in 2016 to 48.6 children. In 2021 kindergartens employed 95,201 people, and 90% of these had kindergarten teacher training at a tertiary level. Despite the number of kindergartens decreasing, it is interesting to note that more people work in kindergartens and that the share of staff with training has increased by 6.3 percentage points in the last five years. This increase is likely related to the new staffing and pedagogical norm, which entered into force.

The municipality must offer a kindergarten place for all children under the compulsory school age. However, despite this statutory right, participation is voluntary, and we see low enrolment for the youngest children. The OECD points to Norway's generous parental leave as a reason why Norway have such a low enrolment of children below the age of one in kindergartens (Engel, Barnett, Anders, & Taguma, 2015). Despite this, the number of children below the age of one who attends kindergartens increases slowly (Statistics Norway, 2022).

Parents use their right to kindergarten. Despite a decrease in the number of kindergartens and nominally fewer children attending them, the cohort's attendance share in kindergartens has increased since 2000 (Bjørkli, 2022). When we look at children aged 1-5, the percentage of the cohort attending kindergarten has gone from 62% to 93.4%. Most of this increase is explained by a surge in attendance of the youngest children before 2008. Today, there are the same number of children attending kindergarten as in 2008 and 2009, with 2013 being the peak year with 287,177 children attending. Therefore, the decrease in the number of children attending kindergarten is related to declining fertility rates; hence fewer children are born

despite a population increase. Consequently, fewer facilities are needed, and we see a consolidation in the form of larger kindergartens.

Norwegian kindergartens can be categorised into ordinary kindergartens, family kindergartens, and open kindergartens (Engel, Barnett, Anders, & Taguma, 2015). Ordinary kindergartens are either public or private and offer half-day or full-day services all year round. Family kindergartens are organised in private homes by one or more families through a family kindergarten assistant. They are thus less professional and have their own regulations; a kindergarten teacher guides the assistant's work with a maximum of five children. Open kindergartens are part-time drop-in facilities where the children do not have a permanent place. The parents and children participate together under the guidance of a kindergarten teacher. Thus, these facilities are not childcare facilities but institutions for pedagogical advice for parents and children. An alternative to institutionalised ECEC for the youngest in Norway is the cash-for-care scheme available to parents who stay home with their children (The Norwegian Ministry of Children and Families, 2021). The scheme is for parents with children between one and two years who do not attend kindergarten full-time. In 2021 the cash-for-care benefit amounted to NOK 7,500 per month and was reduced if the child had a part-time kindergarten place. This scheme is not an alternative for many parents as the cash benefit does not compensate for the lack of a salary.

This paper will focus on ordinary kindergartens as the other types of kindergartens, nor the cash-for-care scheme cannot be considered a perfect substitute. This is due to less professionalism in the care and not being governed by the same regulations. Given the understanding of the Norwegian word *barnehage* we consider public and private ordinary kindergartens as close to perfect substitutes for parents, they fulfil the same need by being centre-based ECEC institutions, and the same regulations apply. Thus in this paper, kindergartens are understood as ordinary kindergartens, either public or private, and in the Norwegian sense. In other countries, the Norwegian sense may often be described as preschool, as kindergarten is more of a school-like setting.

2.2 About Private Kindergartens

More than 97% of all public schools are public in Norway, which is in stark contrast to the 47% of kindergartens (Engel, Barnett, Anders, & Taguma, 2015; Statistics Norway, 2022).

Hence, as a consequence, more than half of the children in Norway attend a private ECEC institution. When looking at other Nordic countries, we see that Norway has by far the largest share of private kindergartens relative to its neighbours (Trætteberg, Sivesind, Hrafnsdóttir, & Paananen, 2021). In the other Nordic countries, 80% of the children attend a public ECEC institution, and the remainder attends private institutions. A large part of this discrepancy in the share of public and private kindergartens is that private for-profit operators played an instrumental role in achieving full kindergarten coverage in Norway. The other Nordic countries achieved this without private kindergartens playing such a detrimental role.

At the beginning of the year 2000, Norway was lagging behind its Nordic counterparts, and as a result, in 2003, the Kindergarten Reform took place (Trætteberg, Sivesind, Hrafnsdóttir, & Paananen, 2021). This is the point where Norway differentiates itself from the other Nordic countries in terms of for-profit providers. Until 2003, for-profit providers' role was negligible, as most private operators were non-profit. The reform ensured regulations and funding on the same level for private and public kindergartens, which resulted in the flourishing of commercial providers. As previously described, there was a sharp increase in coverage, and by 2011 the coverage reached such a level that the government removed the right to free establishment and access to public funding. These changes did not apply to existing private kindergartens; thus, municipalities still have to fund them on a per-child attending basis. Some municipalities have challenged the funding obligations without success (Karlsen, 2019; Jelstad, 2020). The introduction of a maximum price was the mechanism that helped increase the demand for kindergartens. At the same time, the financial toolbox provided by the public contributed to an expansion in the supply (in the form of public and private kindergartens). Today, Norway has a higher coverage ratio than the other Nordic countries and a higher share of private, especially for-profit, kindergartens.

When looking at the Norwegian ECEC market, it is challenging to differentiate between for-profit and non-profit. The main reason for this is the lack of a legal definition of non-profit organisations in Norway (Trætteberg, Sivesind, Hrafnsdóttir, & Paananen, 2021). A governmental-appointed research group looked at the role of private providers in the Norwegian welfare market. They pointed out that the lack of possibility to differentiate between these organisations through legal entities poses a challenge when analysing the welfare market (NOU 2020: 13, 2020). However, for analysis purposes, they stated that all LLCs and sole proprietorships in the kindergarten sector that are not owned by municipalities

as for-profits. Thus, their analysis categorises LLCs with a non-profit clause as for-profit. Further, when PBL (2020) states that one-third of private companies are in the red; this includes non-profit private kindergartens. Despite this issue, the government-appointed group identified in the period 2010 to 2018 that the number of for-profit kindergartens had grown by 34%, and the number of non-profits had declined by 71% in the same period (NOU 2020: 13, 2020, p. 228).

The structural changes in the market for kindergartens complicate analysis further. The current accounting practices enable a large group with more than 100 kindergartens to not deliver complete accounts for every entity (Ministry of Education and Research, 2022). Hence, it is difficult to assess how governmental funding is used. The government seeks to change the law mandating each facility to be a separate legal entity with its own accounts. They point out that this is predominantly an issue with large kindergarten groups where only 30% are separate legal entities.

Traditionally the ECEC market was dominated by many small units, and at the beginning of the reform, the market saw a lot of growth and new establishment of kindergartens. However, the market has shifted towards a consolidation trend in the later years. In 2007, the six most significant players amounted to around 5% of all private kindergartens, while nine years later, the same players amounted to more than 17% (BDO, 2018). However, these groups typically have larger kindergartens. In the same period, their market share, measured in the number of children attending private kindergartens, grew from 11% to 32%, despite the shrinking of the market. These trends point to a market consolidation with the emergence of large kindergarten groups. Another key indicator pointing to the same trend is EBIT; 60% of the aggregated EBIT in the private kindergarten sector belongs to those six players. In addition to large commercial chains, some Nordic private equity players have been present in the market (Bjerknes, 2019). Given the strategies deployed by private equity funds, their presence may have contributed to further market consolidation. The limited ability to take out dividends may be particularly appealing for private equity funds as their financial gain is from the sale of the kindergarten, not dividends. There are no special regulations regarding the acquisition or sale of kindergartens, and the profits generated are used to develop the institution further. One of Telemarksforskning's projects on the consolidation of the ECEC sector in Norway has concluded that if the consolidation growth trend continues, half of the private kindergartens will be owned by the five most prominent players by 2029 (Lunder, 2019).

2.3 Financing of Kindergartens

The government's goal is for ECEC to be accessible to all children regardless of the parents' financial situation (Ministry of Education and Research, 2021). Private kindergartens are financed through municipal grants and parental payments, where the grants account for roughly 85% of total financing (Haraldsrud, 2020).

When the right to establish was removed in 2011, municipalities gained more control over the ECEC in their municipality, and the financing system changed (Trætteberg, Sivesind, Hrafnsdóttir, & Paananen, 2021). Until 2011 the grant was earmarked subsidies from the government for private institutions, while after, the grant came directly from the municipal budget. Since public and private kindergartens were to receive equivalent funding, the average cost of a child in the municipal kindergartens sets the grant level for private kindergartens. Thus, the grant is based on the actual municipal expenditures on public kindergartens. There is no differentiation between for-profit and non-profit kindergartens. Hence, this financing system has a multiplier effect on kindergartens; if they reduce their spending on kindergartens, they also reduce spending on grants to private kindergartens. Conversely, if the municipality invests in kindergartens, the grant expenditures increase; however, they cannot dictate that private kindergartens use those increased grants on investments.

In 2015 there was a change in the way the grant is determined. The main principle is that the grant is based on the actual cost of the municipality to operate its kindergartens. However, the main change is that the grant is based on the cost of running the public kindergartens two years previously. Hence, the grant level is determined based on two-year-old accounts. In addition, there were changes to compensate for the cost of capital and pensions. These changes were made to ensure cohesiveness between the actual costs of the private kindergartens and the grant.

The government regulates the parental payment, and per January 1st 2022, the ceiling is set at NOK 3315 per month for a full-time place. However, the ceiling will be lowered to a maximum of NOK 3050 by August 1st 2022 (The Ministry of Education and Research, 2021). Further, the parental payments are differentiated to support low-income families. Hence, parental payments can correspond to no more than 6% of the household's total income. In addition, there is a sibling rebate, meaning that for parents with two or more children in kindergartens, there is a 70% rebate on the parental payment for child number two and 50%

for every additional child. In addition to the parental payment, Kindergartens have a boarding fee, which varies between kindergartens.

The Kindergarten Act states that public grants and parental payments are to benefit the children (The Norwegian Ministry of Education and Research, 2020). However, the Act does not specify any requirements for using public grants or set any capital lock. The lack of constraints has enabled kindergartens owners to perform sale-leaseback agreements to investment funds. This becomes particularly profitable for kindergartens that received subsidised financing to invest in buildings on land acquired free or below market value (NOU 2020: 13, 2020, p. 409). In addition, owners may sell the kindergarten but retain ownership of the land, hence amassing leasing revenues. Further, through strategic adaptations, an owner can carve out the real-estate part of the company and form a group. Through the collection of rent, it is then possible to withdraw profits from the kindergarten and thus circumvent the dividend limitations for the kindergarten company. Therefore, despite the regulations limiting the use of grants, there are other potential ways to extract public funding from kindergartens. This is mainly due to the absence of a capital lock similar to the one seen in the school sector.

3. Literature Review

In this chapter, I will present the literature relevant to this paper. The literature section will start with a description of the control mechanism imposed by the government to ensure desired quality in kindergartens. Next, look at existing research on quality in kindergartens before looking at some of the determinants of quality.

3.1 Governmental Regulations

The Norwegian government aims for kindergartens to provide a safe environment and promote development and learning (The Norwegian Ministry of Education and Research, 2020). The Norwegian government wants to encourage a diverse choice of kindergartens and ensure transparency and quality for parents. This implies that all kindergartens, regardless of ownership, are subject to the Kindergarten Act and national guidelines (The Norwegian Ministry of Education and Research, 2020). The Act's purpose is to ensure the government's vision while allowing the kindergarten actors to adapt to local conditions and for private kindergartens to have a different purpose and value set than the one described in the law. The most central guideline is the Framework Plan for Kindergartens (The Norwegian Ministry of Education and Research, 2017). The staffing and pedagogical staffing norms have been implemented to ensure a minimum staffing level per child.

3.1.1 Kindergarten reform

Due to the lack of kindergartens and their limited capacity, in 2003, the *Parliament of Norwegian* (Storting) agreed on the kindergarten reform (Korsvold, 2021). It aimed to increase the number of mothers returning to work after maternity by increasing kindergarten coverage. The reform consisted of four central components: building new kindergartens, municipalities were obligated to provide kindergarten space, equal treatment of public and private kindergartens and a maximum parental price for kindergartens (NTB, 2003). This reform was the first where a combination of user choice, free establishment, payments per user, profits, and ambiguous regulations were central components in changing Norway's welfare offering (Trætteberg, Sivesind, Hrafnsdóttir, & Paananen, 2021). This method had previously been used in Sweden and had been a rapid driver for privatisation, especially

combined with beneficial financing agreements. Increasing capacity and achieving full kindergarten coverage was the motivation behind implementing these mechanisms and opening for for-profits.

3.1.2 Kindergarten Act

The Act commits all kindergartens, public and private, to ensure, together with parents, a child's need for care and play, in addition to promoting learning and development (The Norwegian Ministry of Education and Research, 2006). The Act states that kindergartens must be pedagogical facilities; it sets requirements for staffing and the staff's education level to ensure pedagogical quality. Furthermore, it regulates kindergartens' admission and the maximum price and grants offered to private kindergartens. The Act governs the kindergarten industry and provides control mechanisms for the government to ensure equal treatment of the kindergartens and achieve the goals set by the Storting, where grants and parents' fees benefit the children (The Norwegian Ministry of Education and Research, 2020).

There have been several hearings concerning the Act, especially concerning §14a, which states: "Public grants and parents' fees must benefit the children in the kindergarten. The kindergarten may have a reasonable net profit for the year", given that specific criteria are met (The Norwegian Ministry of Education and Research, 2020). This legal phrase is cause for debate and the essence of this paper in many terms. Norway has an ongoing political debate on whether returning a profit and paying out dividends should be allowed when providing welfare services (NOU 2020: 13, 2020). This is considered particularly controversial when the profit may come at children's expense (Lysbakken, Fagerås, & Lerbrekk, 2017). To be allowed to return a profit, these criteria describe how grants are used and state that privately owned kindergartens "cannot have substantially lower staffing costs per full-time place" (The Norwegian Ministry of Education and Research, 2020). These criteria are claimed to be somewhat unclear and cause large corporate kindergarten players to take advantage of these ambiguities to pay out large dividends (Jelstad, 2017).

3.1.3 Framework Plan for the Content and Tasks of Kindergartens

Based on the Act, the Ministry of Education and Research determines the national guidelines for kindergartens, the Framework Plan. "These guidelines set out supplementary provisions on the content and tasks of kindergartens", private and public (Ministry of Education and

Research, 2021). In short, the Framework Plan is the roadmap for kindergartens and gives clear guidelines on delivering kindergarten services of a set quality standard. The current Framework Plan entered into force in August 2017; thus, some parts of the dataset are governed by the previous Framework Plan. The plan treats public and private kindergartens equally, except in terms of the value set, as per the Act's §1a, where private kindergartens may have a different value set (The Norwegian Ministry of Education and Research, 2020).

3.1.4 The staffing norm and pedagogical staffing norm

The Storting wanted to ensure minimum staffing in Norwegian kindergartens and adopted the staffing norm. The staffing norm states a minimum of one employee per three children under the age of three and a minimum of one employee per six children over the age of three (The Norwegian Directorate for Education and Training, 2018). According to the Ministry of Education and Research (2017), the background for the norm was to ensure that kindergartens are of good quality. They believed that the quantity of staff and their level of education was detrimental to the provided quality of kindergarten services. The Ministry stated that there were growing differences in staffing between kindergartens and a widening gap in the number of employees per child between private and public kindergartens. Supported by the report from the Kindergarten Law Committee (NOU 2012: 1, 2012), which clearly states that today's rules were open for interpretation and thus prevented an equivalent offer. The committee recommended legislating a quantified minimum staffing.

The staffing norm entered into force in August 2018, and all kindergartens had to comply with the norm within a year. If they failed to comply, they could apply for dispensation from the norm. In order to ensure the fulfilment of the norm, the governmental budget was increased by MNOK 100, where MNOK 60 was allocated to private kindergartens and the remainder of MNOK 40 to public kindergartens (Innst. 400 S (2017-2018), 2018). There was an emphasis that these funds should particularly support small kindergartens. This norm ensures similar staffing in both private and public kindergartens. Thus, profits should not arise from lower staffing levels but from more efficient operations.

Together with adopting the staffing norm, the Storting adopted an enhanced pedagogical staffing norm. This norm implied a minimum of one employee per seven children under the age of three and a minimum of one pedagogical leader per 14 children over the age of three (The Norwegian Directorate for Education and Training, 2018). The previous norm was a

pedagogical leader per nine and 18 children, respectively. This enhanced norm entered into effect simultaneously with the staffing norm and gave the kindergartens one year to comply with the minimum requirement. The new norm would imply a pedagogical leader density of 43% of the total staff[1]. It is fair to assume that the bid to increase the density of pedagogical staffing is to ensure that kindergartens are pedagogical facilities of quality.

3.2 Quality in Kindergartens

Kindergartens in Norway have been subject to a lot of research. Much of the research is done with an emphasis on pedagogy or quality in kindergartens, as they are often made in relation to kindergarten teacher studies or for decision-making purposes. Several studies have looked at differences in quality between public and private kindergartens, but few have looked at them on a national level and attempted to find causal links.

This paper will look at data on a national level and attempt to find causal factors of quality differences. Given the complex nature of determining quality, especially in terms of welfare services, where interpersonal relations play an essential role, it is thus paramount to bear in mind that this paper is not a study on measuring quality in kindergartens. The paper aims to look at differences in quality and how ownership affects these. Therefore, this quality research review seeks to find the best quality indicators for children's welfare services.

3.2.1 What is Quality in Kindergartens

Quality is a challenging concept to define, especially in terms of childcare, as it covers most aspects of the daily activities of the kindergarten. The American Society for Quality (2021) (ASQ) highlights that quality, to a large extent, is a subjective term where each person, organisation and sector has its definition and understanding. ASQ highlights that in technical terms, these definitions have two meanings "(1) the characteristics of a product or service that bear on its ability to satisfy stated or implied needs; (2) a product or service free of deficiencies" (ASQ, 2021). The first meaning is considerably more valid than the second when discussing childcare services with stated and individual needs.

[1] One staff per 3 children over one pedagogical staff per 7 children equals 43%

The Norwegian government (NOU 2012: 1, 2012) points to professor Søbstad's definition of quality in kindergartens: "the children, parents and the employees' perceptions of and experience with the kindergarten, and to what extent the kindergarten fulfils its academic and societal criteria for what a good kindergarten is"[2] (Søbstad, 2002, S. 17). The societal criteria are defined, in the Norwegian context, by the Kindergarten Act and the current Framework plan. Since societal criteria are constantly evolving, so are the pretext for what constitutes a quality kindergarten. This definition is in line with an adaptation of the old ISO definition of quality to be specific to childcare services: the degree to which a set of inherent characteristics of the kindergartens fulfils the child, parent and society's stated or implied needs and expectations (ISO 9000:2015). Despite the definition of quality in childcare being contextual, it is fair to assume that these needs and expectations have similarities.

The Norwegian government acknowledged that coining a single definition for quality in kindergartens is difficult (St.meld. nr. 41, 2008-2009). Instead, they focus on key factors (from the framework plan) to achieve high quality. The key focus is the child's overall well-being and development (The Norwegian Directorate for Education and Training, 2022).

3.2.2 Determining Quality in Childcare

In 2013 a research group at the Danish Clearinghouse for Educational Research mapped Scandinavian research on quality in kindergartens from 2006 to 2011 (Sommersel, Vestergaard, & Larsen, 2013). Their mapping identifies four primary levels of quality present in kindergartens: structural, process, content, and outcome quality. Despite this multidimensional concept of quality, it is often divided into process and structure quality and measured using both (NICHD Early Child Care Research Network, 2002; Howes et al., 2008). The structural quality comprises the organisational and physical features of the kindergarten; it is generally considered higher when child-adult ratios are low, teachers are trained, and programs, toys, and space are age-appropriate and adequate (Melhuish et al., 2015). On the other hand, process quality refers to the children's daily experiences, including relationships with staff that nurture their development (Melhuish et al., 2015).

[2] Original translation: Barnas, foreldrenes og de ansatte oppfatninger av og erfaringer med barnehagen, og i hvilken grad barnehagen oppfyller faglige og samfunnsmessige kriterier for hva en god barnehage er

One of Sommersel, Vestergaard, and Larsen's (2013) main findings was that some structural prerequisites are crucial for the quality of the kindergarten. These prerequisites are the size of children groups, framework plan, staff training, leadership qualifications and collaboration between the home and kindergarten. Further, they find when reviewing past studies that facilitating pedagogical activity, both in and outdoor, and having enough room for play and informal learning are important aspects of achieving high quality. In the *Long-run benefits from universal high-quality preschooling* study conducted by Bauchmüller, Gørtz, & Rasmussen (2014), they investigated the relations between five structural preschool quality aspects and their 9th-grade Danish exams. They find that a higher staff-per-child ratio, a higher share of male staff, and a higher share of staff with formal preschool teacher training significantly positively impact cognitive and language development. What is thus interesting is that they find that boys benefit more from kindergartens that score higher on these indicators, while minority children benefit significantly more from low staff turnover.

According to an OECD report (Slot, 2018) on the structural characteristics and process quality in early childhood education, process quality is the primary driver for children's development. Although structural elements may directly influence children's development, they mainly facilitate the creation of process quality by enabling the staff to bond with the children and nurture their development (NICHD Early Child Care Research Network, 2002; Slot, 2018). This is in line with Sommersel, Vestergaard, and Larsen's (2013) findings as they uncover that time is one of the most critical aspects of ensuring a high degree of process quality. A low child-to-staff ratio would imply that more time is devoted to each child and, in turn, more time to reflect and improve. Despite the existence of the correlation between structural and process quality, both strong and weak, it is said that high structural quality enhances process quality, hence the overall quality (Ishimine, Tayler, & Bennett, 2010).

4. Data

This section provides a summary of the data sources, initial manipulations, and sample descriptives.

4.1 Data Selection

The scope of the paper limits itself to ordinary kindergartens and differentiates between private and public kindergartens. Public kindergartens are in the data sample only municipal-owned. There are a small number of state and county-owned kindergartens; however, they are financed in the same fashion as private kindergartens and are thus regarded as private kindergartens. Further, the paper will look at the private kindergarten sector as a whole, as the Norwegian kindergarten funding policy does not differentiate between for-profit and non-profit

To analyse the research question data about Norwegian kindergartens are required. All kindergartens in Norway must report annually to the Directorate for Education and Training (The Norwegian Directorate for Education and Training, 2015). According to the Kindergarten Act (The Norwegian Ministry of Education and Research, 2020), both public and private kindergartens must report to the Directorate for Education and Training; however, what they have to report varies slightly. The different reports are compiled and accessible from the BASIL database on kindergartens. BASIL bases itself on the annual report for kindergartens and the income statement for non-municipal kindergartens. BASIL includes all kindergartens registered in the National Kindergarten Registry (NBR), which comprises all authorised kindergartens in Norway (The Norwegian Directorate for Education and Training, 2022).

The data gathered from BASIL and NBR is publicly available through the Norwegian Directorate for Education and Training's statistical bank on kindergartens. The data available is comprehensive and provides details on the individual kindergartens in Norway. Most of these indicators are of interest to this paper and give a good perspective of the structural quality of the kindergarten. The database forms national statistics on kindergartens, research by publicly appointed research groups, and interest organisations such as the PBL. A potential source of error is related to data entry in the database. Kindergartens have to manually report

in the form of a questionnaire; given the questionnaire's comprehensiveness, human error may occur, which in turn may cause incorrect registration in the database. There are no mitigating practices to prevent incorrect registration as the report is not audited. Despite this, we consider the data provided by the database as high quality, as the potential incorrect data entries are negligible.

In addition to the data gathered in the BASIL database, the Directorate for Education and Training sends out a *kindergarten parental survey* (KPS) (The Norwegian Directorate for Education and Training, 2019). The goal is for parents and guardians to express their opinion on the kindergarten's facilities, the children's well-being, the collaboration between them and the kindergarten, and their overall satisfaction with the facility. Each autumn, one questionnaire per child is sent to the parents; however, it is voluntary for kindergartens and parents to participate. The questionnaire contains approximately 30 questions, with some local variations; see Appendix A for the complete questionnaire. The questionnaire's format is on a scale from 1 to 5, hence limiting error data. Since 2018 the KPS has been published through the Norwegian Directorate for Education and Training's statistical bank on kindergartens. However, the data is accessible down to the facility level, with some limitations for privacy reasons. There has to be a minimum of five answers to a question for it to be published. Thus, there are more data available for larger kindergartens. Another potential issue with the data is the yearly collection period; a more frequent collection may capture possible seasonal variations. Overall the data is considered to be of good quality.

This paper will use two datasets from the Norwegian Directorate for Education and Training's database. The first dataset is about the kindergartens, based on the information from the BASIL database, and provides information on the structural quality using structural indicators from 2014 to 2020. The second dataset is the average answers to the KPS from 2018 to 2020 at the kindergarten level. These datasets differentiate between public and private kindergartens. Since the largest commercial kindergartens are claimed to challenge the Norwegian kindergarten model and traditions, the largest players have been identified to see how their ownership affects quality. These groups are Læringsverkstedet, FUS, Espira and Norlandia. In addition, two kindergartens groups (Gnist and Espira) were identified to be in ownership by private equity funds during that period (Bjerknes, 2018; Bergsaker, 2021). The facilities controlled by the four largest groups or under private-equity ownership are identified using the NBR database; see Appendix B and C, respectively. In addition, we have separated

those private kindergartens that are not part of the largest four groups or PE-owned and called that category for independent.

To control for external socioeconomic effects, additional data has been included; the summary statistics of these can be seen in Appendix D. National data on unemployment by county in the period 2016-2019 is used (Statistics Norway, 2021). The data is gathered monthly, and November figures of the corresponding year are used in order to match the sampling period of the KPS. Statistics Norway's definition of unemployed is people who are able to work, seeking income-generating employment at the *welfare office* (NAV), are available to work and have not had income-generating work for the past two weeks. Data on real estate prices are provided by Eiendomsverdi and are not publicly available. Their data is collected using both publicly available records and data from real estate agents and covers close to all transactions in the Norwegian property market. The data is on a post-code level and contains Norwegian real estate prices in the period 2014-2019. If no transactions exist on a given post-code for a given year, this observation is set to the county mean.

4.2 Data Manipulations

The Norwegian Directorate for Education and Training's statistical bank provides data on kindergarten's structural indicators back to 2014 up until 2020. When removing non-ordinary kindergartens, the total number of observations in the period is 36,491, which are distributed as follows:

	2014	2015	2016	2017	2018	2019	2020	Total
Observations	5,370	5,313	5,263	5,201	5,149	5,129	5,066	36,491

However, two of the indicators, the staff's education and child per staff, are only reported from 2016. Further, data from 2020 is available; however, due to the Covid-19 pandemic and governmental restrictions limiting kindergartens' activities, this year is left out of the analysis (The Norwegian Directorate for Education and Training, 2020). Given this, only observations occurring in 2016-2019 are considered in this analysis, which implies 20,742 observations.

In Norway, significant reform of the municipalities and regions started in 2017 and lasted until 2020. Consequently, some observations are counted twice in the dataset due to their county or municipality having changed during the year. Due to the presence of duplicate values, a facility is only represented once in the dataset, and duplicate observations arising from the reform are removed. Some few kindergartens lacked visiting addresses and were therefore removed from the dataset. Due to the implementation of the staffing and pedagogical norm in 2018, we want to look at kindergartens that were operational before and after the implementation. Hence, kindergartens that have closed or opened in the period are removed. This implies that the number of observations is constant for every year in the period. Therefore, the number of observations is 20,424, meaning 5,106 observations per year. This is somewhat less than the 5,152 ordinary kindergartens reported to be active in 2019; given this negligible difference (less than 0.9%), the sample is considered highly representative of the ordinary kindergarten sector.

The raw data provides the number of children in each age bracket. However, for comparison purposes, this data is transformed into shares to analyse kindergartens' composition better. The share is found by dividing the number of children in an age bracket by the total number of children. Some kindergartens have not reported any children in some age brackets, especially children of age 0; thus, the average sum of shares for a kindergarten does not equal 100%.

The indicator child per kindergarten teacher is winzorised at the 1% level due to some extreme observations indicating more than 300 children per kindergarten teacher. This is not representative of the vast majority of the facilities or the same facility over the years. Due to the negative impact of these extreme outliers, the data is winsorized to reduce their influence and to render any conclusion based on the data representative of the vast majority of the population. By winzorising, the standard deviation is reduced by 33% for the dataset as a whole on this indicator, a variation that, to a greater extent, represents the actual variation of child per kindergarten teacher between the majority of facilities.

The KPS dataset provides the average answers to each category shown in Appendix A. For the data to be coherent with the structural indicators dataset, and for the same reason, the 2020 year is left out of the analysis. Further, only ordinary kindergartens are considered, which leaves a total of 6,009 observations over the two years, 3,030 in 2018 and 2,979 in 2019.

5. Differences in Quality

This section will look at the differences in quality between types of facilities. The analysis is done on the descriptive data from the structural indicators and the KPS. To assess any significant differences, we will run a t-test to analyse whether there is a difference in the mean of the quality indicators between the private and public kindergartens. It is not fair to assume that private kindergartens are homogenous; thus, we proceed to check if there are any differences in quality between the various categories of private kindergartens using an *analysis of variance* (ANOVA). As the norm changes directly impact the structural quality indicators, we want to see whether the different facilities improved similarly. While process quality is the goal and not structural quality, we want to look at the relationship between these in the context of Norwegian kindergartens using a simple OLS regression.

5.1 Empirical Strategy

5.1.1 Analysis of Mean Between Public and Private Kindergartens (T-test)

Since we are interested in whether there is a significant difference in the mean of a given quality indicator in two different samples, public and private kindergartens, we will run a t-test (Hanck, Arnold, Gerber, & Schmelzer, 2021). More precisely, a two-tailed two-sample t-test, as there are two different populations, and we want to analyse whether the means differ. The test is possible as the observations are independent, and we assume they are approximately normally distributed and have similar variances.

We will denote the means as $\mu_{i1}$and μ_{i2}Where i is the quality indicator in question, and 1 and 2 are the ownership forms. This gives the following hypothesis

$$H_0 = \mu_{i1} - \mu_{i2} = 0 \; vs. \; H_1 = \mu_{i1} - \mu_{i2} \neq 0$$

The null hypothesis H_0 can be tested with the t-statistic $t = \frac{\mu_{i1} - \mu_{i2}}{\sqrt{\frac{s_{i1}^2}{n_{i1}} + \frac{s_{i2}^2}{n_{i2}}}}$. Where s is the standard errors of the respective groups and n is the number of observations in the group. When translating the t-value to a p-value, we reject the null hypothesis at the 95% confidence interval; hence variables with p-values higher than 0.05 are dismissed. This implies that with

a low p-value, we reject the null hypothesis and conclude that there is a significant difference in this quality indicator between the ownership forms.

5.1.2 Analysis of Mean Between Private Kindergarten Categories (ANOVA)

We will use one-way ANOVA to determine whether there is any statistical difference in the means of the quality indicators between private kindergarten categories (Cote, Gordon, Randell, Schmitt, & Marvin, 2021). We have three classes: private (ex., the four largest groups and PE-owned kindergartens), the four largest groups (ex. when PE-owned), and PE-owned. Thus, all the observations are independent; further, we assume that the variances are homogenous and that the observations are approximately normally distributed. By performing an ANOVA instead of multiple t-tests, we reduce the risk of making a Type I error[3] from 14.3% to 5% (α level) (Lund Research Ltd, 2018).

The test has a similar null hypothesis to the t-test $H_0 = \mu_{i1} = \mu_{i2} = \mu_{i3}$. Where i is the quality indicator in question, and 1, 2 and 3 are the ownership forms. We set the confidence interval to 95%. The test only gives an insight into whether the means are statistically different from each other. If we reject the null hypothesis, it does not provide any insight into what categories were different. To identify which categories have statistically different means, we perform a post hoc test.

Tukey's honestly significant difference (HSD) will be used as a post hoc test (Cote, Gordon, Randell, Schmitt, & Marvin, 2021). It determines whether means are statistically different from each other and have the same assumptions as the one-way ANOVA. The test compares pairwise and examines whether the means' differences are greater than the expected standard errors for the given confidence interval.

5.1.3 Analysis of the Relationship Between Structural and Process Quality

As highlighted earlier, process quality ensures children's well-being and development, and structural quality is merely a driver for it. According to Sommersel et al. (2013), time with

[3] Mistakenly rejecting a true null hypothesis

children is the primary driver for process quality; hence there should be a relationship between the structural and process quality. A linear regression analysis looks at the relationship between one or more *independent* variables and a *dependent* variable. For this analysis, an *ordinary least squares* (OLS) regression will be used to look at the relationship between the structural quality indicators as the independent variable, X_i, and the process quality indicators as the dependent variable, Y_i, for a given observation. The theoretical framework presented in this section is based on Stock & Watson (2019), and they define the linear regression model as

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i.$$

In the model, the subscript i runs over the number of observations, β_0 is the intercept and β_1 is the slope coefficient. ϵ_i is the error term depicting the distance between the actual and predicted observations. The interpretation of the β_1 coefficient is as follows for every unit change in X corresponds to a change in Y equal to β_1. Hence, a unit change in a structural quality indicator will correspond to a change in the process quality indicator equal to β_1, assuming causality.

The regression line is created by estimating the best linear fit, which explains the linear relationship between the independent and dependent variables. In an OLS regression, this is done by minimising the sum of the squared difference between the predicted, $b_0 + b_1 X_i$, and the actual observation, Y_i. This can be expressed as

$$min \sum_{i=1}^{n} (Y_i - b_0 - b_1 X_i)^2.$$

The results are squared as some observations are above the regression line while others are below. The line that minimises the squares is expressed as $\beta_0 + \beta_1 X_i$.

The OLS model hinges on three assumptions. (1) The distribution of errors, ϵ_i, is normally distributed around a mean of zero, (2) the observations are drawn randomly from the population and (3) large outliers are unlikely.

5.2 Findings

The results from the empirical strategy are presented jointly with the descriptive data on the facility level.

5.2.1 Structural Quality Indicators

Overall, the structural quality indicators seem similar in magnitude, with a slight advantage towards public kindergartens, as shown in Tables 1 and 2. However, there are statistical differences, as shown in Tables 4, Panel A, 5, Panel A, and 6, Panel A and B. Table 1 focuses on the difference in quality between private and public kindergartens. Table 4 Panel A shows the t-test results between public and private kindergartens. In contrast, Table 2 focuses on the differences within the private kindergarten group: the largest groups, PE-owned and independent kindergartens. Table 5 Panel A presents the results of the ANOVA and whether there are any differences between these. Table 6 Panel A and B show between which groups there are any significant differences in quality. All tables are over the same 35 variables.

It should be noted that an overweight of the observations in the PE-Owned column occurred prior to 2018, as EQT took AcadeMedia, Espira's parent company, public at the end of 2017. Due to the left-skewness of the observations and the time-period effect of norm changes, the mean of the PE-owned kindergartens may indicate an underperformance on some indicators that are affected by the new legislation. The extracts presented are based on Table 1 and 2 for the indicators in question and only shows the mean; for further details, please look at the tables mentioned in this paragraph.

When we look at the educational level of staff in the kindergartens, we do not see a major difference between the public and private kindergartens, as shown in Extract 1. What is immediately striking is that the share of kindergarten teachers is approximately the same across all kindergarten categories. The null hypothesis holds across the board, and there is no significant difference in the share of kindergarten teachers across kindergartens types. This implies that the largest group of staff, and the one considered the most important to kindergarten quality by policymakers, occupies the same share of total staff in all kindergartens categories. However, the remaining 60% of the workforce has statistical differences, especially the percentage of Child Care and Youth Workers and employees with other backgrounds. Where 25% of all staff in public kindergartens are trained Child Care and

Youth Workers, the same ratio is ten percentage points lower for the private kindergartens, with a significant effect. We see that private kindergartens have a significantly larger share of employees with other backgrounds to compensate. This group of employees does not have a skilled worker education or a higher education. When we look closer at the private kindergartens, there is no significant difference in the staff composition between PE-owned kindergartens and the largest groups. On the other side, independent kindergartens have a significantly larger share of skilled workers. The key takeaway when looking at staff composition is that public kindergartens have a statistical larger share of the formally trained workforce than the private sector. At the same time, there is no difference in the percentage of kindergarten teachers among the overall staff across the categories.

	Public	Private	Independent[4]	Groups	PE
Kindergarten teacher	39.3%	39.4%	39.4%	39.4%	39.0%
Equivalent to kindergarten teacher	1.3%	1.6%	1.7%	1.0%	0.9%
Other pedagogical education	1.0%	1.7%	1.8%	1.6%	0.9%
Child Care and Youth Worker	25.2%	15.7%	16.0%	14.5%	15.5%
Other higher education	1.5%	3.0%	3.1%	2.5%	2.4%
Other skilled worker	4.9%	4.1%	4.0%	4.0%	5.0%
Other background	26.8%	34.6%	33.9%	36.9%	36.2%

Extract 1: Staff composition

There is an interesting pattern when we look at the child composition within kindergartens in Extract 2. We see instantly that the public and private kindergartens are similar in size[5] ; any difference is not statistically significant. However, we see a statistical difference in the size between the different categories of private kindergartens. We note that the largest groups'

[4] Private kindergartens who are not part of the four largest groups nor PE-Owned

[5] Size is always a reference to the number of children in a kindergarten throughout the paper

kindergartens are much larger than the rest of the private facilities, and the independent kindergartens are relatively smaller than the public ones. Further, we note that PE-owned kindergartens are again almost twice the size of the average private and public institutions. An interesting observation is that all categories of kindergartens have a similar standard deviation for the number of children despite having large differences in size. Thus, the assumption that the more the kindergarten is commercial, the bigger it is seems true. However, the size difference is more likely to be caused by location than the ownership form; More commercial kindergartens are developed in more urban areas with a greater demand for ECEC, hence a larger kindergarten size. Size should thus be controlled for when assessing the effect of private ownership.

	Public	Private	Independent	Groups	PE
Number of children	53.5	53.98	47.158	76.916	97.266
0 years old	1.8%	2.9%	3.1%	2.3%	2.3%
1 year old	14.6%	16.1%	16.0%	16.2%	16.3%
2 years old	20.2%	20.2%	20.2%	20.1%	20.5%
3 years old	21.6%	21.1%	21.2%	20.8%	20.7%
4 years old	22.3%	21.6%	21.8%	21.0%	20.8%
5 years old	23.5%	21.9%	22.2%	21.0%	20.2%

Extract 2: Composition of Children

Another significant pattern that emerges when looking at the age groups in the kindergartens in Extract 2 is that private kindergartens have a significantly larger share of young children. In contrast, public kindergartens have a significantly larger share of elders. As a consequence of legislation, this implies that private kindergartens would require more staffing due to the larger share of young children to comply with the new norms. This would be especially true for independent private kindergartens, which have the significantly largest share of young children. The causal reason for this is not apparent, as parents have the same application portal

when they apply for kindergartens. However, as seen in Extract 3, public kindergartens are slightly cheaper; thus, parents may seek to switch to a public kindergarten. I.e. in the early years, the most important is to secure a kindergarten place, and price is less of a factor, while in the later years, price is a more prominent factor.

When we look at the public kindergartens in Extract 3, we see that they offer more room per child; on average, $10m^2$ more than the private, which is a significant difference. The more commercial the facility is, the smaller the living area per child; we see that the independent facilities are statistically larger than the two other categories, which are not significantly different in area per child. This may be somewhat related to the commercial kindergartens being in more populated areas, where real estate is more expensive. The opening hours, which are statistically different between public and private facilities and categories, may point to the same. We see a negative correlation between living area per child and opening hours, which may point to a necessity to stay open longer. Private kindergartens are remunerated based on the number of children staying, not opening hours. Initially, this may seem counterintuitive as extending the opening hours is a cost driver rather than revenue. However, we acknowledge that opening hours may be a preference criterion for parents, allowing for larger kindergartens. The positive correlation between opening hours and the number of children presented in Extract 2 supports this argument.

	Public	Private	Independent	Groups	PE
Living area per child, sqm	66.6	56.4	57.3	53.4	51.3
Opening hours per day	9.59	9.75	9.65	10.09	10.26
Boarding fee	271.7	324.9	315.4	356.6	376.5
Parental payment below maximum	5.2%	4.0%	4.6%	2.2%	0.0%
Have been supervised	43.7%	54.7%	54.3%	56.5%	58.6%

Extract 3: Structural Parameters

As stated previously, private kindergartens are statistically significantly more expensive than their public counterpart. Evidence of this is seen in terms of boarding fees, and fewer private kindergartens have a parental payment below the price ceiling set by the government; all of these differences are statistically significant between the categories. We further notice that none of the PE-owned kindergartens have parental fees below the ceiling; this may be related to the mission to develop the kindergarten quickly. They are boosting revenues to quickly develop the kindergarten as well as using revenue creation as an argument for a higher sales price when the PE fund exits that investment. Another interesting thing to note is that all of the largest groups of kindergartens with a parental payment below the maximum were located in Oslo municipality in 2019, thus pointing to a municipality-level reason for the lowered maximum price. Among the different private kindergartens, we see the same effect as seen above: the independent ones are less commercial. Hence, they are significantly cheaper than the largest groups and the PE-owned facilities.

Further, we note that the difference in mean between the largest groups in terms of parental payment is insignificant at the 95% confidence level, despite the 2019 observations. PE-owned facilities are nevertheless more expensive due to their significantly higher boarding fees. The conclusion is that the less commercial the kindergarten is, the more affordable it is, and children have more living room.

What is interesting to note is that municipalities are the entities that supervise kindergartens, and there is statistically far less supervision of public kindergartens. For a given kindergarten, the likelihood of being controlled changes by more than ten percentage points whether the kindergarten is private or not, as seen in Extract 3. This difference is highly significant, while the probability of being controlled between the private kindergarten categories is statistically the same. When we look at Extract 4, below, it may seem like the municipalities give their kindergartens preference. There is an 11.4% probability that a given public kindergarten will not comply with the pedagogical norm. In comparison, this probability stands below 8% for a given private kindergarten. We even see that most commercial kindergartens have the lowest possibility of statistically not fulfilling it.

	Public	*Private*	*Independent*	*Groups*	*PE*
Child per employee	5.69	5.93	5.84	6.25	6.39
Child per kindergarten teacher	15.20	15.68	15.45	16.47	17.14
Dispensation from educational requirements for ped.leaders	28%	29%	27.2%	35%	29%
Dispensation from staffing norm	5%	3%	3.5%	2%	1%
Fulfils the pedagogical norm	67%	68%	68.8%	64%	71%
Does not fulfil the pedagogical norm	11%	8%	8.7%	5%	3%
Fulfils the ped.norm with dispensation	21%	25%	22.5%	31%	27%

Extract 4: Norm ratios

Having fewer children per staff allows for more interactions and spending more time with each child, thus the potential creation of process quality. Hence, the child-to-staff ratios are considered key ratios. Despite having the same share of kindergarten teachers, we see in Extract 4 that they are responsible for significantly more children in private than public facilities. In addition, public kindergartens are significantly better staffed per child, which is somewhat surprising considering the significantly larger share of young children in private kindergartens, which implies a higher staffing ratio by law. We especially notice that the largest groups and PE-owned kindergartens have, respectively, one and two more children per kindergarten teacher. However, the difference among them is not significant, while the difference in the general staffing ratio is statistically significant. The independent kindergartens significantly outperform the other private ones. While the largest groups have a significantly larger share of dispensations for educational requirements relative to the independent ones, they have a significantly lower share of staffing norm dispensation—the same pattern as for the public and private kindergartens. This might be seen in tandem with the higher share of kindergartens that fulfil the pedagogical norm with the dispensation. The key takeaway is that public kindergartens are significantly better staffed for a given

kindergarten. However, significantly more likely for a given kindergarten not to fulfil the pedagogical norm.

Extract 5 indicates the distribution of full-time equivalents (FTE) for the different categories and the share of male staff. We note immediately that private and public kindergartens have a relatively similar level of staffing, which is logical given that they are relatively equal in size. However, there are some nuances. Despite all kindergartens being legally required to have a director with at least kindergarten teacher education, we note that private kindergartens have them part-time to a greater extent, indicating a significantly leaner structure. Further, we note that private kindergartens have significantly more pedagogical leaders in terms of FTE, while public kindergartens have more basic staff. Logically, the largest kindergartens groups and PE-owned kindergartens have significantly more FTEs, which is logical given their larger sizes, while the smaller independent have a lower level of FTEs.

As Bauchmüller, Gørtz, & Rasmussen (2014) found, having a larger share of male staffing positively contributed to quality, especially for boys. Thus, when looking at the gender composition, we note that public kindergartens have a significantly lower share of male staff than private kindergartens for all but director positions. We further see that the largest groups have significant outperformance over the independents on almost all indicators. In addition, the largest groups outperform the PE-owned facilities in terms of total male staff. There is no statistical difference here between the independent kindergartens and those PE-owned.

	Public	*Private*	*Independent*	*Groups*	*PE*
FTE Directors	0.94	0.87	0.84	0.98	1.12
FTE Pedagogical leaders	5.20	5.31	4.69	7.36	8.94
FTE other basic staff	6.97	6.85	6.06	9.49	12.06
FTE basic staff in total	12.16	12.16	10.75	16.85	20.99
Male directors	7.60%	8.0%	7.8%	8.9%	5.5%
Male pedagogical leaders	6.80%	9.5%	9.3%	10.2%	8.1%
Male other basic staff	6.70%	11.9%	11.8%	12.4%	10.1%
Mall basic staff in total	6.70%	10.9%	10.8%	11.5%	9.2%
Male directors and basic staff in total	6.90%	10.7%	10.6%	11.4%	9.0%

Extract 5: Full-Time Equivalents and Male staff

It is impossible to determine whether one ownership form outperforms the other from the structural indicators, as on some indicators public kindergartens outperform private ones, and on other indicators the opposite is true. Overall, it may seem that public kindergartens, on the most critical aspects of structural quality, are somewhat better performing: staffing per child and level of trained staff. Given that the ratio of children to staff and children to kindergarten teachers are considered the essential parameters, and there was a statistical difference between all categories, they will be analysed further when determining if the difference in quality is related to its ownership form. Among the private kindergartens, we consider that independent kindergartens are slightly better performing than the largest groups and PE-owned ones in terms of structural quality. However, between the largest groups and PE-owned, there is no apparent difference in terms of quality.

5.2.2 Process Quality Indicators - Kindergarten Parental Survey

There are two service users in the kindergarten context, children and parents. From the child's perspective, kindergartens provide an arena for socialising and development. While parents

are users in two senses, (1) kindergarten provides a day-care service enabling parents to resume working full-time and (2) helping parents educate their child. Given that for children, it is difficult to express the qualities of the interactions, there is no empirical data on the subject. However, we can use the KPS indicators as proxies for process quality, assuming that parents' and children's interests are aligned and that parents can assess the children's experience from their kindergarten interactions.

What is instantly to note from Table 3 is the lower number of observations present in the KPS than the structural indicators, in addition to fewer variables. Three main factors explain this: it is voluntary for a kindergarten to carry out the KPS, privacy reasons and a shorter sample period. The share of private kindergartens is 53%, which is equal to the registered share of private kindergartens in the period. Despite the lower number of observations in Table 3, we see from Table 4 Panel B that there are significant differences in the mean, with a 95% confidence interval for all indicators. This indicates that private kindergartens have a significantly higher level of process quality, as measured by the KPS, compared to public kindergartens, as shown in Extract 6.

In addition, it is worth noting that only a few PE-owned kindergartens carried out the KPS, all from the same group (Gnist) and in the same year, 2019. Any conclusion regarding process quality for the PE-Owned kindergartens would thus have little validity outside Gnist. However, they manage to collect the statistically significant largest number of answers and achieve the highest response rate on the KPS together with the largest groups, as seen in Tables 5 Panel B and 6 Panel C. Upon closer inspection, we note that the public sector has a significantly lower response rate than the private kindergartens and a larger variation between the answers, in terms of standard deviation. This indicates that private kindergartens deliver a more homogenous service in the parents' eyes. Given the high response rate of more than 70% on average for a given category, we consider these observations representative of the kindergartens.

	Public	*Private*	*Independent*	*Groups*	*PE*
Outdoor and indoor environment	4.0	4.2	4.3	4.2	4.2
Relationship between children and adults	4.5	4.6	4.6	4.5	4.4
The child's well being	4.7	4.8	4.8	4.8	4.7
Information	4.2	4.3	4.4	4.3	4.2
The child's development	4.6	4.7	4.7	4.6	4.6
Participation	4.2	4.3	4.3	4.2	4.1
Pickup and delivery	4.3	4.4	4.5	4.4	4.3
Adaptation and school start	4.4	4.5	4.6	4.5	4.4
Satisfaction	4.4	4.6	4.6	4.5	4.4
Number of answers per kindergarten	39.8	43.1	35.4	56.9	80.8
Response rate	70.1%	73.0%	71.7%	75.3%	75.3%

Extract 6: KPS Summary

Looking closer at the private kindergartens in Table 5 Panel B, the ANOVA returns that all variables are significant at a 95% level. Through the post hoc test, it is clear that independent kindergartens on all but one variable significantly outperform the other private categories regarding process quality, as seen in Table 6 Panel C. We further notice that the largest kindergartens and the PE-owned ones have no significant difference in process quality as determined by the KPS; despite having large differences in means, this difference is not statistically different from zero. This is due to the low level of observations among PE-owned ones, resulting in a large confidence interval. We also notice that the Groups have a significantly larger response rate than the independent. However, all are over 70%, and thus we consider the KPS to portray an actual view of the process quality in a given private facility.

Despite public kindergartens having a larger area per child, parents significantly prefer the environment the private kindergartens provide, which might indicate a better use of the site,

hence rendering the indicator of the area per child as a quality indicator ambiguous. For the other indicators, parents are relatively happy with the service provided by the kindergarten; all indicators are above 4. However, somewhat more satisfied with the private kindergartens as all the indicators exceed the public kindergartens. If we take the sum of the KPS indicators, we notice that private kindergartens are above by one 1.1 grade relative to the public kindergartens. While the other categories of private kindergartens have a greater sum than the public ones, the difference is more negligible, 0.6 and 0.05 of a grade for the largest groups and the PE-owned, respectively. This difference is very well shown in the variable *overall satisfaction*, which gives the same ranking as the sum of indicators when ranking the different kindergartens.

We can conclude that private kindergartens, particularly independent kindergartens, significantly outperform the rest regarding process quality. However, whether the ownership form causes this remains unclear, especially given the significant structural differences and the link between structural and process quality, as described in Section 3.2. For further analysis of the effect of ownership we will proceed with three indicators from the KPS that best coin process quality, the relationship between children and adults, the child's development, and overall satisfaction. From a parent's perspective, the latter indicator is truly the indicator that best represents the overall quality in a given kindergarten, especially given the vagueness of the term quality in kindergartens.

5.2.3 Analysis of the Effect of Legislation Change on Selected Structural Quality Indicators

When looking at the structural quality indicators, it is interesting to see how they perform pre and post-the-change in legislation to determine how the legislation change affects the different kindergartens. As kindergartens report their numbers in November of each year, and the legislation took effect in 2018 with a one-year transition period, we will look at this transition before, during and after to determine how the different kindergartens are affected. Private equity-owned kindergartens are not considered a separate category due to the divestment of Espira and the acquisition of Gnist in 2018. Thus, it is impossible to see how legislation changes affect this category. Further, the significance analysis is done between the public, independent and largest groups.

Table 7 Panel A shows the descriptive statistics, while Panel B and C give the ANOVA and Post Hoc test results. When we look at the "Child per employee" ratio, we notice that all indicators have statistically significant means. Before the legislation, public kindergartens had fewer children per kindergarten teacher, while independent kindergartens had slightly more. The largest kindergartens group have more than half a child per unit staff. It is worth noting that the largest groups have a much lower standard deviation than independent and public kindergartens. This makes sense, as it is fair to assume that these groups have streamlined their operations and have common guidelines to a larger degree. All categories improve during the intermediate period and post- legislation period (2019). We note that in terms of magnitude, all kindergartens are below the minimum threshold of 6 children per employee. Public kindergartens are still significantly outperforming the other categories. However, in terms of magnitude improvement, the largest groups are the best performers, with more than half a child less per employee.

It is somewhat concerning to see that especially the independent kindergartens are not improving more, especially given their larger share of young children, which legally and practically requires more staff. What is thus interesting to note is that with the new legislation, private kindergartens have become more homogenous in terms of variations from the mean, measured in changes in standard deviation. This is an expected development, as it implies that kindergartens that are not meeting the legal norm would improve while those already meeting it remain the same or improve negligibly; this would cause the standard deviation to reduce. Here it indicates that private kindergartens, especially the largest groups, are pushing to meet the new legislation relative to public kindergartens. However, when we look at the private kindergartens, we see that they improve as a group, but the spread increases, meaning a less homogenous staffing ratio. The reason for this is unclear; however, it is worth noting that municipal kindergartens are significantly less likely to be supervised, as shown in Extract 3. It might also be related to some kindergartens already meeting the requirement not to improve, while some provide better structural quality to improve; this seems unlikely.

When analysing the kindergarten-teacher ratio, we notice similar patterns as with general staffing. Before the new norm, we see that public and independent kindergartens have the same ratio. In contrast, the largest groups have a significant difference of more than a child more per kindergarten teacher. The pattern of standard deviation is a bit different; where we see an improvement over the period for public kindergartens, we see a deterioration for the

private kindergartens with an increase in standard deviation. Interestingly, in the transition period, we see an overall improvement in the indicator; however, we do see a large spike in standard deviation across the board. This effect is most prominent among private kindergarten facilities, where the standard deviation increases with more than one. Several factors probably cause this, but two are more likely (1) an inelastic labour market for kindergarten teachers and (2) kindergartens using the flexibility of the transition period not to employ new kindergarten teachers to save funds. It is fair to assume that all kindergarten teachers wanting to work with children are already doing so. Thus, to acquire new kindergarten teachers, they must train more or increase their salaries to convince those who have left the industry to return. The latter is the most flexible solution as kindergarten training is a bachelor's degree; hence the supply of newly educated kindergarten teachers is not flexible to such an extent. This argument moves towards argument number 2, as they would have to increase salaries to bring onboard new kindergarten teachers; they may want to use the flexibility offered in the transition period. This seems reasonable, especially considering that the funding private kindergartens receive is based on the operational costs of the public kindergartens two years prior, and the exceptional grant by the government was only available from August 2018, and the numbers are reported as of November. Hence, private kindergartens, due to the current funding model, lacks the flexibility to accommodate any radical changes in the cost structure, here a large increase in the labour costs due to the leggedness of the funding premise. This argument is further strengthened by the fact that only public kindergartens either improve or return to the same standard deviation as before the implementation of the legislation. At the same time, the other categories see an increase in standard deviation compared to before.

When looking at the result, we see that public kindergartens have improved the most and are the only groups with a mean ratio below the set norm of 14. The difference between public and independent kindergartens is not significant. Despite being the ones who attracted the most staff per child during the transition period, the Big 4 as a group improved the least in terms of attracting skilled workers and are still understaffed in terms of child per kindergarten teacher. This might be seen in terms of the significantly higher share of kindergartens operating with a dispensation from the norm. However, the difference in improvement compared to the others is not significant. To conclude, public kindergartens significantly outperform independent kindergartens in terms of structural quality with the change in legislation.

5.2.4 Relationship Between Structural and Process Quality Indicators

The relationship between the structural and process quality indicators is interesting to investigate, as structural indicators are easier to measure and improve. When looking at the years 2018 and 2019, we can look at the relationship between the structural indicators and the KPS. Figure 1-3 shows the relationship between structural and process quality.

Looking at Figure 1, we clearly see that independent kindergartens, on average, have a higher degree of process quality as measured by parental satisfaction. We notice instantly that the largest groups are, to a larger extent, clustered around the legal limit of six children per employee. The public kindergartens deliver, on average, the lowest process quality for any given level of children per employee. When looking closer at the regression lines, we notice that children per employee have no impact on the parents' satisfaction with the facility for the largest groups. For independent and public kindergartens, children per employee have a significant linear relationship with process quality. However, more significant and twice as impactful for independent kindergartens. This means that if staff had the responsibility for one more child (a unit increase in the independent variable), it would reduce parents' overall satisfaction by 0.04 points. Despite being significant, the explanatory power is not large, and even less for the public and largest groups. From this, we cannot conclude that having more employees per staff improves process quality.

When looking at Figure 2, we see the effect of having more formally trained staff in the form of kindergarten teachers. Instantly we note that most facilities have between 5 and 30 children per kindergarten teacher with some outliers, despite winzorising. We also note that private facilities have better process quality for any given level. The regression lines have similar and significant slopes for all facility types. The overall parental satisfaction is reduced by 0.008 and 0.009 for the largest groups for any given increase of a child per kindergarten teacher. However, the explanatory power is not large, as it explains between 2% and 4% of their overall variation in quality.

Given the few outliers in Figure 2, we are interested in reducing the sample size to represent the majority of the facilities. Thus, in Figure 3, we see the facilities with a children per kindergarten teacher ratio of 30 and below. Reducing the sample size affects the regression lines, especially for the private facilities where a change in the structural quality now has a

larger impact on the process quality. There is a reduction of 0.005, meaning that for a unit increase in the children per kindergarten teacher ratio for a given facility, there is now a 0.005 worsening in satisfaction for private facilities relative to before. Hence, 0.012 and 0.013 compared to 0.008 and 0.009 for the independent and largest groups, respectively. Reducing the sample size has affected the overall explanatory power negatively. Further, we can see that public kindergartens' process quality is less affected by a change in the structural quality.

Given that Figure 1-3 includes the transition period of 2018, as detailed in 5.2.3, this might affect the independent variable in an unknown manner for 50% of the observations. When looking solely at 2019, we find similar results. As Figure 4 shows, public and independent kindergartens have a more prominent relationship in the form of a steeper slope and a slightly better explanatory power. For the largest groups, the relationship is inverse of what we would expect, meaning that the better the staffing, the less satisfied parents are with the facility; however, this relationship is not significantly different from zero. Independent kindergartens are still outperforming public kindergartens in terms of process quality for any given level of structural quality, within the range, despite the differences in slopes.

When looking at the relationship between child per kindergarten teacher and the overall satisfaction in 2019, as shown in Figure 5, we note that this relationship is similar to the one presented in Figure 2. However, the slopes and explanatory powers have increased marginally except for the largest groups, which have a decrease in slope hence a less prominent relationship. We still note a large part of outliers; hence in Figure 6, we restrict the observation to those with 30 or fewer children per kindergarten teacher in 2019. As in the other cases from 2019, we note a slight improvement in the relationship and the explanatory power for all categories.

There is a linear relationship between structural quality, in terms of child per employee and child per kindergarten teacher, and process quality, in terms of overall parental satisfaction. Despite the existence of a linear relationship, the structural indicator explains, at best, below 5% of the overall variation in the process quality. Private kindergartens deliver a higher process quality for any observed level of structural quality, and the relationship is more prominent. When removing the effect of a transition year, 2018, the linear relationship improves slightly; however, it does not explain much of the observed variation.

5.2.5 Conclusion on Quality Differences statistics

When looking at the descriptive statistics alone, it is impossible to determine whether private or public kindergartens deliver the highest quality. The structural indicators might point to a higher quality in public kindergartens, especially when looking at the key indicators, child per employee and child per kindergarten teacher. This, in turn, is an enabler for time with children and competence to ensure the children's development. On the other hand, the KPS serves as a proxy for process quality and gives an advantage to private kindergartens, particularly independent kindergartens.

However, when looking at the change in legislation, which has affected the level of staffing, hence the key structural indicators, we see that public kindergartens are better able to meet the new staffing norm. Sommersel et al. (2013) also identified a significant linear relationship between structural and process quality. This relationship is stronger for private and, in particular independent kindergartens. However, in contrast to the findings of Sommersel et al., this relationship does not explain large parts of the process quality, and this is true for all types of facilities. These results highlight the need to analyse how the effect how ownership plays.

6. The Impact of Ownership Form on Quality Differences

In this chapter, we will look at the effect of private ownership on the quality of the different facilities. As identified in Section 5, two structural and three process quality indicators have been selected to identify the effect of private ownership on the quality of kindergartens. To assess the ownership form's impact, the data is organised as panel data and will be analysed using fixed-effects regressions.

6.1 Empirical Strategy

We want to study if the significant difference in the selected quality indicators stems from ownership. To do so, we will analyse the relationship between the ownership form and the selected quality indicator by controlling for multiple variables and analysing if this relationship is statistically significant. However, given the vague nature of quality in kindergartens and its creation, process quality in particular, and structural quality enablers, the risk for omitted variable bias is highly present. By organising the data as panel data, we reduce the omitted variable bias of the coefficient by controlling for facility and time-fixed effects. The following section on panel data is based on Baltagi (2005) and Stock & Watson (2019).

A considerable advantage of organising the data as panel data is the possibility of controlling for individual heterogeneity. It is fair to assume that kindergartens are heterogeneous as the combination of environment, children, staff, and organisation gives each kindergarten their own unique characteristics. For example, kindergartens in rural areas differ from urban ones in size, area, staffing abilities, and more; therefore, we want to control for these individual characteristics without omitting these observations. Panel data studies will further allow us to study the dynamics of adjustments due to the changing legislature during the period, as we can follow and control for individual effects.

The structural quality indicators are balanced panel data, as described in section 4.2, while the process quality indicators are unbalanced panel data due to the differing numbers of observations. However, as some observations lack proper reporting on structural indicators, they are thus omitted, resulting in an unbalanced panel. This does not affect the methodology,

simply how to perform it in practice. The datasets will be analysed using a variation of the following equation

$$Y_{i,t} = \beta P_{i,t} + \alpha_i + \lambda_t + \overrightarrow{C_{\iota,t}} + \overrightarrow{S_{\iota,t}} + \epsilon_{i,t}$$

$P_{i,t}$ takes the value of one if facility i is private in year t. We are interested in the coefficient β, which shows the relationship between private ownership and the quality indicator $Y_{i,t}$. Only indicators found relevant using the method described in 5.1 will be analysed. The equation includes fixed effects (α_i) and time-fixed effects (λ_t), which captures omitted variable bias that arises from unobserved variables that are constant over time or constant over kindergartens. The time-fixed effect will help single out the impact of legislative changes and other general improvements over time. As there is a concern that omitted variables through the fixed effect coefficients could be affected by ownership form, results with random effects will also be presented. The same equation will be run where the ownership variable $P_{i,t}$ is replaced with $B4_{i,t}$ and $PE_{i,t}$. This is to study the effects of the more commercial forms of ownership on the quality indicator, respectively, if they are a part of the four large groups or are PE-owned.

Since the Norwegian Government report by Vassenden, Thygesen, Bayer, Alvestad, & Abrahamsen (2011) on the impact of structural factors on quality identified differences based on kindergarten size, we want to control for size effects. The vector $C_{i,t}$ includes two binary control variables for kindergarten capacity. The threshold limits are based on the report by Vassenden et al., with small kindergartens being smaller than 45 children and large kindergartens being larger than 80 children. Further, the vector includes opening hours, which is directly linked with staffing, and the share of male staff due to its link with long-term quality, as pointed to by the study by Bauchmüller et al. (2014). In addition, we want to control for factors that may arise from socioeconomic factors; these are controlled for using the vector $S_{i,t}$. The vector contains postcode-level indicators for housing prices and county-level unemployment indicators. These indicators are to capture any exogenous influence on the quality indicator that may arise from the kindergarten's environment. The results will also be presented without controls.

To study whether the ownership form affects quality, we will examine whether the effect captured through coefficient β is significant. This is done using a fixed effect regression where we let the intercept of the regressor vary across the individual observations. The estimation

method is the "entity-demeaned" OLS regression method. This method computes the means of each facility for a given quality variable and then subtracts the facility mean from the observation before running the regression on this demeaned variable. This method is computationally more efficient than the alternatives.

6.2 Findings

We consider two quality forms with five indicators for four different types of facilities, which are either public or private.

6.2.1 Proxy due to Lack of Fixed-Effect Variations

Due to the data's structure, we cannot identify facility-fixed effects. This is due to the lack of transactions within the categories; hence the facility fixed effects are non-existent. We must add facility-level control variables because we cannot control for facility-fixed effects. However, this will lead to a higher degree of omitted variable bias; an alternative is to use a proxy to be able to capture facility-fixed effects. As seen earlier in Extract 3, there are significant differences in the boarding fees across all categories; hence we can model it as a proxy.

Figure 7 shows the relationship between ownership and boarding fees. The means of each category are statistically different and increase as the facility types become more commercial. Hence, we see a linear relationship as illustrated by the regression line. The interpretation of this line is that for every increase in commercialisation, the boarding fee increases by NOK 41. The interpretation of the constant is not straightforward as the first category is denominated as 1 and not 0; thus, the constant plus 41 equals the public kindergarten category means. The explanatory is not great, as seen in the plot and shown by the R-squared of 0.076. However, the regression gives a very high test statistic in the form of an F-statistic, indicating that the ownership types highly explain the overall volatility. Despite not having immense explanatory power, this is the indicator that is best suited as a proxy for ownership form. The results will be shown with and without a proxy.

6.2.2 The Effect of Private Ownership on Structural Quality

When looking at the effect of ownership on the structural quality indicators, there are some significant differences caused by ownership form. However, there is no clear link between ownership form and structural quality.

Children per Employee

Looking at Table 8, we see that the effect of private ownership is significant on the structural indicator of *children per employee.* In fact, it is the greatest when performing a linear regression with no control variables. However, when controlling for time effects, such as the skewed impact of legislation, the magnitude of the impact is reduced. Due to the risk of omitted variables, we have included some control variables. By including these, we see that the effect of ownership is more than halved, pointing to children per employee being affected by factors other than private ownership. Interestingly, these factors seem to be mostly internal, such as size decisions, opening hours, and the share of male employees; all have a larger impact than socioeconomic factors. Model number 3 in Table 8 has a fairly good explanatory power; however, we do note that private ownership accounts for only 0.1 of the difference in children per employee. Thus, facilities' choices impact staffing more than a pure ownership trend.

When looking at the proxy, which in turn accounts for facility-fixed effects in addition to time-fixed effects, we note that it is insignificant. Hence, when accounting for facility fixed effects, there is no significance in the relationship between ownership form and child per employee. However, it should be noted that when using a simple OLS model, there is no significant relationship between ownership and child per employee. Hence, despite a relationship between ownership form and child per employee, the proxy fails to identify such a relationship.

Looking closer at the different types of private kindergartens in Table 9, we note some interesting effects. Using a simple time-effect regression, we see that independent facilities have a statistically significant lower staffing per child. However, when accounting for facility and socioeconomic effects, the effect is negative but no longer significant. The largest groups have a significant effect of half a child more per employee; however, this effect is halved when adding the control variables. The truly interesting effect is when looking at the PE-owned facilities, where there is only a significant relationship when controlling for facility

and socioeconomic factors, none of which are significantly different from zero. The assumption is that PE-owned kindergartens are, to a larger extent, homogenous; hence any differences arise from the ownership form.

Child per Kindergarten Teacher

The Norwegian government sees the amount of qualified and skilled staff as one of the most important indicators. Table 10 presents the relationship between public and private ownership and the level of children per kindergarten teacher.

When looking at Table 10, we immediately notice that using a regular OLS regression and a time fixed-effect regression, there is a significant relationship between ownership form and the level of children per kindergarten teacher. There is a time-specific fixed effect, which arises from the ownership form is less than what we would have expected given the explanation detailed in 5.2.3. However, when adding control variables to account for facility-fixed effects, we note a high degree of facility-fixed effects as the indicator weakens and is no longer statistically different from zero. In addition, several of the control variables added to account for facility-fixed effects are statistically significant. The proxy indicator is statistically insignificant regardless of the model; hence we do not analyse it further. Hence, we cannot say that there is a relationship between ownership form and the level of children per kindergarten teacher.

We note interesting patterns when looking at the effects within the different forms of private kindergartens, as shown in Table 11. When controlling for facility fixed-effects, all ownership forms significantly affect the number of children per kindergarten teacher. This points to the possibility of there being a causal relationship between the degree of private ownership and the level of children per kindergarten teacher. In addition, we note a lesser degree of importance of the facility indicators, such as size and male staffing, than when comparing private with public. This strengthens the argument that there may be a causal relationship between the degree of privacy and children per kindergarten within private kindergartens. However, none of the models bears a great deal of explanatory power, and the best models explain shy of 4% of the total variation of the dependent variable.

Final Remarks on Structural Quality

There is a statistically significant relationship between ownership form and staffing levels, children per employee. However, when looking at the ownership form and skilled staff,

children per kindergarten teacher, the ownership form is not statistically different from zero when adding facility-level control variables. Hence, there is no clear link between the structural quality of the facility and its ownership form. Despite differences in quality between private and public facilities, as identified in 5.2.1, the difference cannot be said to arise solely from the difference in ownership form. A large part of the differences in quality seems to be attributed to facility-level factors and some socioeconomic factors.

Within the private kindergartens, a larger part of the differences seems to stem from the ownership form. When controlling for time-fixed effects and some facility factors, we see that the largest groups and the PE-owned kindergartens have significant differences that their ownership can explain. Hence, differences in structural quality may arise from the degree of private ownership.

6.2.3 The Effect of Private Ownership on Process Quality

In contrast to structural quality, which to a large extent, is controlled by regulatory norms, process quality is a result of the operation; thus, ownership form has a greater impact. All PE-related observations stem from one group; thus, we cannot draw any conclusion based on this group activity to account for the industry practises within ECEC services.

The Relationship Between Children and Adults

When looking at Table 12, we see a linear relationship between private ownership and the relationship between the children and the adults working in the kindergarten, as perceived by the parents. There is a significant effect in all three models for private ownership on the process quality indicator. We cannot identify any time-fixed effects as the OLS model and the time-fixed-effect are the same. When adding control variables, in contrast with the relationship for structural quality indicators, there is an increase in magnitude in addition to being significant. Despite the model not having an immense explanatory power for the dependent variable, we note that ownership is the most important factor in terms of magnitude. From this relationship, there seems to be a potential link, and those private kindergartens are better at providing a good relationship between children and adults. The proxy is insignificant, so we cannot say that boarding fees affect the relationship between children and adults.

Looking closer at the relationship between children and adults within the different private kindergartens in Table 13, we note that independent kindergartens are the only kindergartens

that provide a significant positive effect. When looking at the largest groups, we note that when adding facility and socioeconomic indicators, the ownership effecrt is no longer significant; hence we cannot say that differences arise from its ownership form and are most likely related to the environment and the form of the kindergartens. On the other hand, PE-owned kindergartens seem to have a significant negative effect on the process quality. However, the explanatory power is low, and the observations of PE-owned kindergartens in the KPS are the same. Given this, it seems fair to assume that factors within the independent kindergartens that are not present in the more commercial kindergartens are what drive the positive effect on the relationship between children and adults; this might be unobserved factors such as better work-environment

Development

The same trend as seen in the relationship between children and adults can be seen in the children's development, as shown in Table 14. All three models show that ownership significantly differs from zero on the child's development; however, the models only explain a small part of the overall variation. When adding control variables, we see that ownership has a larger impact and has the greatest impact of the independent variables. This indicates that there may be an underlying causal relationship that arises from private ownership. The boarding fees have no significant effect on the children's level of development, as perceived by the parents. Hence, the proxy model is rejected.

The same trend, as explained in the previous section, is seen among the different private kindergartens, as shown in Table 15. However, we note that all ownership indicators are significant when adding control variables. PE ownership significantly affects children's development negatively, while the largest groups have a significantly positive effect. The reason why the PE and largest groups indicators are only significant when adding control variables seems to stem from the homogeneity of the facilities. Therefore when controlling for facility-fixed effects, the ownership becomes significant. Independent kindergartens have a significant positive effect, especially when accounting for fixed effects.

Satisfaction

Overall satisfaction has been established as the key metric throughout this paper. Looking at Table 16, we see that private ownership significantly impacts the satisfaction of the kindergartens. We see little time-effect, only a small increase in the overall variation, as seen

as the increase in standard deviation between model 1 (OLS) and model 2 (time-fixed effect regression). Hence, we can deduce that time has similarly affected both categories for the period 2018-2019. When facility level and socioeconomic control variables are added, we see that ownership in facts explains more of the variation and the explanatory power of the model increases. This is because a lot of the overall variation is explained by other factors.

When we look at the control variables, we note that small kindergartens have higher satisfaction. This points to commercial kindergartens, which are larger in size, having poorer satisfaction than independent kindergartens, which are smaller in size, ceteris paribus. However, it should be noted that larger sizes, despite hurting quality, is not significant. A strange effect is that a higher number of opening hours harms overall satisfaction; this effect is somewhat illogical as one would assume that parents desire added flexibility. However, this may be linked to staffing and that kindergartens with long opening hours have more shifts and thus may feel more impersonal, as it is not necessarily the same staff there for pickup and delivery.

When looking at the socioeconomic factors, we see that kindergartens in counties with a high unemployment rate have parents who are less satisfied with their services; however, this effect is only significant at the 10% level. Initially, we see an illogical effect when looking at housing prices, as the higher the square meter price has a negative effect on parental satisfaction. In contrast, higher housing prices have a positive effect. These effects are significant and similar in magnitude but inverse. The logic behind this effect is that high square meter prices often occur in the city centres, where other factors may affect parents' overall satisfaction. In contrast, higher housing prices occur in richer neighbourhoods which often are regarded as better and safer. Hence, we should analyse further the effect of larger cities where these discrepancies are the most important. The proxy models bear no significance and lose importance when controlling for time and facility effects.

Table 17 shows the different private kindergartens, and it is interesting to note that independent kindergartens significantly outperform other kindergartens. However, in contrast to the effect of private versus public ownership, we see that when adding control variables, the effect of independent kindergartens is somewhat reduced but remains significant, while the effect is opposite for the explanatory power of the model. Being PE-owned seems to hurt parental satisfaction; however, due to the selection, this effect cannot be allocated to the PE-ownership itself. For kindergartens to be of a large group have no significant effect on parental

satisfaction. Most of the differences between the largest groups and public kindergartens are attributed to structural elements, such as location.

Final Remarks on Process Quality

Process quality is the goal of kindergartens, and there is a statistically significant positive correlation between private ownership and process quality. This holds for all three types of process quality indicators. However, private ownership is not a source for process quality, here measured through KPS indicators, but merely an indicator for other underlying trends. This becomes clear when looking closer at the process quality among private kindergartens. The private kindergarten sector is made up of large parts of independent kindergartens and a few large groups, and it is clear that independent kindergartens are by far outperforming the other ownership categories. It seems unreasonable to attribute this outperformance merely to ownership; however, being an independent kindergarten provides more liberty to adapt the business to the users' needs (parents and kindergartens), hence strengthening the parents' overall satisfaction. Further, structural differences play an important role in process quality as measured by the parents' observations. When looking at overall satisfaction, size and location seem to be two factors that significantly affect the process quality.

6.2.4 The Effect of Large Cities on Parental Satisfaction

As shown in sections 6.2.2 and 6.2.3, housing prices seem to affect quality significantly. However, to a large extent, housing prices are proxies for socioeconomic factors and an indicator of location. A high average square meter price indicates a location close to the centre, while a high average price usually indicates a higher socioeconomic standard. Further, most rental units are usually located near the centre, and most renters have a lower socioeconomic background than property owners in Norway. Given the great variation in housing prices in Norway, across the country and intra-city, we want to analyse this effect further on parental satisfaction. The following sections will look at parental satisfaction excluding the largest cities and within the largest cities, as defined by SSB and shown in Appendix E, using the housing prices relative to the county median to offset pricing differences across counties and capture the location effects and socioeconomic effects.

As we see from Table 18, there is a significant positive correlation between satisfaction and private ownership throughout all models. We see that private ownership has a larger effect on

satisfaction within cities than outside. Further, public and private kindergartens are more homogenous outside of cities than within in terms of parental satisfaction, as measured by standard deviation. However, size is a more important factor outside cities, where larger kindergartens significantly affect the parents' satisfaction negatively, while this effect is positive and insignificant in cities. What is interesting is the illogical effect of opening hours and its significant negative correlation with quality. We see that the model for within cities explains ten percentage points more of the overall variation in satisfaction than the model for outside cities.

Given that housing prices are the only significant indicator in model 2 and not in model 3, we can deduce that socioeconomic background is a larger influencer of quality in cities. Hence, parents' background and the environment play an important role in the parents' perception of quality in cities, but not outside. When looking closer at these significant indicators, we see that private kindergartens have a larger impact on parental satisfaction in rich neighbourhoods with expensive houses than in poorer neighbourhoods. We note that the city centres, in the form of relatively high square meter pricing, do not have a significant effect different from zero on process quality.

	Whole Country	*Within Cities*	*Outside Cities*	*High m^2 Price*[6]	*Low m^2 Price*	*High Price*	*Low Price*
Public	47.0%	50.1%	45.2%	46.5%	65.6%	43.6%	70.9%
Independent	34.3%	34.3%	34.3%	39.9%	26.7%	39.1%	18.9%
Largest Groups	18.4%	15.4%	20.2%	13.6%	7.8%	17.0%	10.3%
PE - Owned	0.3%	0.2%	0.3%	NA	NA	0.3%	NA
Observations	6009	2181	3828	346	450	1508	419

Extract 7: Share of different kindergartens in the KPS and the number of observations that meet the criteria

	Whole Country	*Within Cities*	*Outside Cities*	*High m^2 Price*	*Low m^2 Price*	*High Price*	*Low Price*
Public	4.42	4.39	4.45	4.46	4.36	4.45	4.35
Independent	4.62	4.61	4.62	4.65	4.63	4.62	4.63
Largest Groups	4.51	4.51	4.51	4.49	4.37	4.51	4.44
PE - Owned	4.45	4.45	4.45	NA	NA	4.45	NA
Average	4.51	4.48	4.52	4.55	4.48	4.52	4.48

Extract 8: The average parental satisfaction score (1-5) for kindergartens that meet the criteria

When looking at Extract 7, we see immediately that the share of public kindergartens is higher in cities than outside of them, while independent kindergartens have a similar market share.

[6] The categories are the upper and lower quartile (Q1-Q2 and Q3-Q4) of the real estate prices within a given county on postcode level data. They are determined through the average prices of the postcode area relative to the average of the county as a whole.

PE-owned kindergartens are negligible, and their share is the same. However, the largest group established a larger presence outside the main cities. When we look at the differences in satisfaction, Extract 8, we see that parents are more satisfied with their kindergarten outside the main cities. At the same time, this effect is less prominent in private kindergartens.

We note a higher share of private kindergartens in expensive areas, that be, high prices or high square meter prices. Especially in areas with prices in the lowest quartile, we note a clear dominance of public kindergartens, where more than 70% of the market share is covered. Given that the areas with prices in the upper quartile have a higher satisfaction score than those in the lower quartile, this suggests that socioeconomic background is an important factor in determining process quality. As an example, we have seen that parents are significantly more satisfied with independent kindergartens; these have a larger presence within cities in areas with expensive real estate. These are areas that score better than the city average and national average. A supporting argument is the number of observations within areas with real-estate prices in the upper quartile, which is 3x higher than the next category—suggesting that parents with a high socioeconomic background spend more effort following up on their toddlers. However, it should be noted that families with youngsters are not evenly distributed within cities. It is fair to assume that when expecting children, parents are willing to seek larger homes with outside areas, which in turn, to a larger extent, are present in areas with relatively higher housing prices.

When looking closer at Extract 8, we note that the difference in scores between high and low prices and square meter prices are due to the largest groups and public kindergartens. The independent kindergartens perform relatively similar across the cities, with the largest score delta of 0.02. At the same time, the same delta is 0.10 and 0.12 for the public kindergartens and the largest groups, respectively. This points to independent kindergartens being better adapted to their surroundings, which may be partially due to the ownership form. Where municipalities (public kindergartens) and the largest groups operate several kindergartens, they have the benefit of standardising procedures, thus making them less flexible; independent kindergartens do not have this benefit. Thus they can be assumed to be more flexible and better adapted to their surroundings.

When looking back to Table 18, we note that private kindergartens significantly positively affect satisfaction within cities. Interestingly, size is no longer a significant quality factor in contrast to Vassenden et al.’s (2011) findings on structural quality. This is due to the subset's

criteria; consequently, kindergartens are more homogenous. As discussed above, we see that private ownership has a larger effect in areas with high prices; the explanatory power of model 4 supports this compared to models 5 and 6. They are pointing to the socioeconomic background as a key differentiator of quality embedded in the private kindergarten's suitability to meet the needs of parents in this area. Given PE-owned kindergartens' lack of presence in the KPS and within different city areas, we disregard them from the rest of the analysis.

As Table 19 shows, there is a strong significant correlation between being independent and parental satisfaction. This effect is strongest in neighbourhoods with relatively expensive real estate, where the variation is also the lowest. Hence, independent kindergarten in expensive areas provides a higher and more homogenous service in parents' eyes regarding process quality. Looking at the largest groups, we see that they outperform public kindergartens throughout all models. However, only models 1 and 2 are significant, and model 2 is only at a 10% level. This points to the kindergartens within the largest groups being, to a greater extent, tailor-made to meet the needs of parents with a higher socioeconomic background while strengthening the argument of the independent kindergartens being more adaptable due to their consequent significant outperformance. From a business perspective, it is logical for kindergartens who look to streamline their operation to operate mostly in the areas with expensive real estate, as here is where they are the most needed. Assuming the laws of supply and demand hold, we see that the supply of kindergarten services is by far the largest in areas with expensive housing, as seen in Extract 7; hence, the largest customer base must be there as well. The socioeconomic background seems to be a key enabler of higher quality. However, given that independent kindergartens can provide stable high process quality, we cannot conclude that. Rather, it seems that kindergartens' adaptability to provide ECEC services is the key differentiator. However, it should be noted that ownership form explains a greater part of the overall variation within the expensive areas, as seen in the explanatory power of model 1 versus model 2 and model 3 versus 4.

7. Conclusion and Further Studies

Given the overarching goal of the Norwegian government to provide quality ECEC, the premise of this thesis was to establish if private ownership benefits the children and if the ownership form impacts quality. This important sector has seen a great increase in activity by private companies over the past 20 years. The past ten years have caused a great level of consolidation together with some PE activity, generating a great level of debate between the political flanks in Norway on the involvment of private companies in welfare services. Norwegian ordinary kindergartens are the ideal setting to analyse, given the close to even split between public and private facilities and public grants to encourage wide use of the services.

Due to the complex nature of quality in ECEC, this thesis differentiates between structural and process quality. When comparing the means of key structural indicators, we can conclude that public kindergartens significantly outperform their private peers. The same comparison of process quality indicators shows the opposite result: private outperform public kindergartens. When looking closer at different types of private kindergartens, we see a significant outperformance by independent facilities over the largest groups and PE-owned facilities on all quality measures.

When looking at the effect of private ownership on key structural quality indicators, we cannot see any clear outperformance in terms of structural quality between public and private facilities when controlling for time effects and adding facility level and socioeconomic control variables. The same analysis shows a significant relationship between private ownership and process quality indicators. Further, we find that independent kindergartens significantly outperform other private kindergartens, while the more commercial ones perform on par with public facilities. We further find that size, opening hours and location are factors that greatly impact parental satisfaction. When looking closer at the effect of cities, private kindergartens perform similarly within and outside of cities, while public kindergartens perform better outside of cities. When looking within cities, we see a clear and strong outperformance of independent kindergartens throughout the cities. In contrast, we only see an outperformance of the largest groups over public facilities within the richest neighbourhoods.

Since process quality is the main objective, private ownership benefits the children, but we cannot conclude that ownership impacts quality. The latter cannot be concluded as we see such large variations between private facilities, and private ownership is merely an indicator

of other underlying trends, such as facility adaptability, work environment and teaching methods.

7.1 Further Studies

There exist many possibilities for future work. Despite this thesis pointing to private ownership benefiting children in terms of process quality indicators, the indicators are by default a proxy as they are the parent's point of view. Further research should focus on gathering data to use quality metrics encapsulating the key goal of quality in Norwegian kindergartens; these may be but are not limited to ITERS and ECERS-R/E.

The models used cannot capture the whole of facility fixed effects due to no variation in the ownership indicators. Therefore, future research should focus on capturing this effect to better isolate the effect of private ownership. Further, the study's design does not allow for any causal conclusion. Hence, it would be beneficial to identify and study kindergartens that are transferred from private to public or vice versa to identify the effect of private ownership. Further, any future study should aim to identify the reason why independent kindergartens outperform any other ownership form to such an extent. This would help elevate all players to a higher level, further benefiting children, parents, the government and taxpayers. Due to the increased activity of private companies in the delivery of welfare services and related debate, further studies should identify how to best align the interest of the commercial players with those of taxpayers, consumers and the government.

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Tables and Figures

Table 1: Descriptive Statistics of Public vs Private

Descriptive Statistics

	All			Public			Private		
	Mean	Count	SD	Mean	Count	SD	Mean	Count	SD
Kindergarten teacher	39.4%	20,007	0.116	39.3%	9,892	0.117	39.4%	10,115	0.115
Equivalent to kindergarten teacher	1.4%	20,007	0.056	1.3%	9,892	0.055	1.6%	10,115	0.057
Other pedagogical education	1.4%	20,007	0.045	1.0%	9,892	0.037	1.7%	10,115	0.052
Child Care and Youth Worker	20.4%	20,007	0.161	25.2%	9,892	0.161	15.7%	10,115	0.146
Other higer educatiom	2.2%	20,007	0.059	1.5%	9,892	0.044	3.0%	10,115	0.070
Other skilled worker	4.5%	20,007	0.088	4.9%	9,892	0.095	4.1%	10,115	0.081
Other background	30.7%	20,007	0.172	26.8%	9,892	0.170	34.6%	10,115	0.166
Number of children	53.746	20,016	31.227	53.502	9,893	31.363	53.983	10,123	31.092
0 years old	2.5%	5,974	0.027	1.8%	2,165	0.022	2.9%	3,809	0.028
1 year old	15.4%	19,074	0.071	14.6%	9,383	0.071	16.1%	9,691	0.07
2 years old	20.2%	19,625	0.071	20.2%	9,647	0.074	20.2%	9,978	0.068
3 years old	21.3%	19,710	0.063	21.6%	9,715	0.066	21.1%	9,995	0.059
4 years old	22.0%	19,695	0.069	22.3%	9,716	0.072	21.6%	9,979	0.065
5 years old	22.7%	19,602	0.075	23.5%	9,666	0.079	21.9%	9,936	0.07
Child per employee	5.812	20,025	0.7	5.688	9,900	0.767	5.933	10,127	0.602
Child per kindergarten teacher	15.443	19,835	5.345	15.196	9,766	5.087	15.683	10,069	5.575
Dispensation from educational requirements for pedagogical leaders	28.30%	19,988	0.45	27.60%	9,902	0.447	28.9%	10,112	0.453
Dispensation from staffing norm	4.00%	20,424	0.196	5.00%	9,903	0.217	3.1%	10,356	0.173
Male directors	7.80%	19,875	0.258	7.60%	9,904	0.250	8.0%	10,018	0.265
Male pedagogical leaders	8.10%	19,875	0.143	6.80%	9,905	0.131	9.5%	10,018	0.152
Male other basic staff	9.30%	19,875	0.137	6.70%	9,906	0.113	11.9%	10,018	0.153
Male basic staff in total	8.90%	19,874	0.108	6.70%	9,907	0.092	10.9%	10,018	0.118
Male directors and basic staff in total	8.80%	19,875	0.104	6.90%	9,908	0.089	10.7%	10,018	0.113
Living area per child, sqm	61.438	19,869	41.949	66.605	9,909	54.773	56.351	10,013	22.064
Opening hours per day	9.67	19,869	0.502	9.589	9,910	0.431	9.75	10,013	0.552
Boarding fee	298.50	19,869	106.75	271.691	9,911	90.252	324.88	10,013	114.851
Parental payment below maximum	4.6%	19,869	0.21	5.2%	9,912	0.223	4.0%	10,013	0.197
Have been supervised	49.3%	19,868	0.5	43.7%	9,913	0.496	54.7%	10,013	0.498
Fulfils the pedagogical norm	67.4%	19,869	0.469	67.2%	9,914	0.470	67.6%	10,013	0.468
Does not fulfil the pedagogical norm	9.6%	19,869	0.295	11.4%	9,915	0.318	7.9%	10,013	0.269
Fulfils the pedagogical norm with dispensation	23.0%	19,869	0.421	21.4%	9,916	0.410	24.5%	10,013	0.430
FTE Directors	0.905	19,875	0.376	0.940	9,917	0.402	0.871	10,018	0.346
FTE Pedagogical leaders	5.255	19,866	3.028	5.199	9,918	3.023	5.311	10,017	3.033
FTE other basic staff	6.906	19,867	4.159	6.966	9,919	4.343	6.847	10,015	3.969
FTE basic staff in total	12.156	19,874	6.995	12.157	9,920	7.159	12.155	10,018	6.830

This table presents the summary statistics of the structural quality indicators used in the analysis. The data is descriptive for all facilities in the period 2016-2019, with the unit of observation being the facility year. Columns 1, 2 and 3 present means, number of observations and standard deviations for the entire sample. The data is categorised into two groups, public and private. Columns 4, 5 and 6 present the same data for public-owned facilities and the last three columns for privately owned facilities. Private facilities are all facilities that are not municipally owned. For most variables, nearly 50% of the observations are categorised as public facilities. The subsequent three columns present the same data for public facilities and the latter for private facilities. The sample size varies slightly as some facilities have not reported on all the data for all the years. The yellow shaded variables are considered key indicators. For a definition of all the variables, please see Appendix F. Facilities not present in the whole period are omitted from the dataset. The indicator Child per Kindergarten Teacher is winsorized at the 0.5% and 99.5% levels.

Table 2: Descriptive Statistics of Largest Kindergarten Groups and PE-Owned Kindergartens

Descriptive Statistics

	Independent			Largest Groups			PE-Owned		
	Mean	Count	SD	Mean	Count	SD	Mean	Count	SD
Kindergarten teacher	39.4%	7,839	0.121	39.4%	2,246	0.093	39.0%	227	0.087
Equivalent to kindergarten teacher	1.7%	7,839	0.061	1.0%	2,246	0.039	0.9%	227	0.035
Other pedagogical education	1.8%	7,839	0.056	1.6%	2,246	0.039	0.9%	227	0.027
Child Care and Youth Worker	16.0%	7,839	0.153	14.5%	2,246	0.118	15.5%	227	0.114
Other higer educatiom	3.1%	7,839	0.075	2.5%	2,246	0.052	2.4%	227	0.043
Other skilled worker	4.0%	7,839	0.084	4.0%	2,246	0.069	5.0%	227	0.066
Other background	33.9%	7,839	0.172	36.9%	2,246	0.140	36.2%	227	0.133
Number of children	47.158	7,842	27.328	76.916	2,249	31.587	97.266	229	36.52
0 years old	3.1%	2,595	0.03	2.3%	1,190	0.021	2.3%	146	0.017
1 year old	16.0%	7,428	0.073	16.2%	2,231	0.06	16.3%	229	0.06
2 years old	20.2%	7,702	0.072	20.1%	2,244	0.051	20.5%	229	0.052
3 years old	21.2%	7,719	0.062	20.8%	2,244	0.048	20.7%	229	0.044
4 years old	21.8%	7,704	0.069	21.0%	2,243	0.052	20.8%	229	0.048
5 years old	22.2%	7,664	0.073	21.0%	2,240	0.057	20.2%	229	0.052
Child per employee	5.841	7,853	0.616	6.246	2,243	0.418	6.39	228	0.297
Child per kindergarten teacher	15.452	7,789	5.663	16.472	2,248	5.180	17.136	229	5.463
Dispensation from educational requirements for pedagogical leaders	27.2%	7,836	0.445	34.6%	2,244	0.476	28.8%	229	0.454
Dispensation from staffing norm	3.5%	8,022	0.183	1.8%	2,300	0.134	1.3%	238	0.112
Male directors	7.8%	7,755	0.262	8.9%	2,233	0.278	5.5%	227	0.221
Male pedagogical leaders	9.3%	7,755	0.157	10.2%	2,233	0.133	8.1%	227	0.109
Male other basic staff	11.8%	7,755	0.158	12.4%	2,233	0.131	10.1%	227	0.105
Male basic staff in total	10.8%	7,755	0.122	11.5%	2,233	0.104	9.2%	227	0.082
Male directors and basic staff in total	10.6%	7,755	0.116	11.4%	2,233	0.101	9.0%	227	0.08
Living area per child, sqm	57.226	7,750	20.731	53.362	2,233	26.060	51.286	227	8.585
Opening hours per day	9.651	7,750	0.547	10.086	2,233	0.420	10.257	227	0.334
Boarding fee	315.38	7,750	116.24	356.601	2,233	194.933	376.47	227	73.91
Parental payment below maximum	4.6%	7,750	0.209	2.2%	2,233	0.148	0.0%	227	0
Have been supervised	54.3%	7,750	0.498	56.5%	2,233	0.496	58.6%	227	0.494
Fulfils the pedagogical norm	68.8%	7,750	0.463	63.9%	2,233	0.480	70.5%	227	0.457
Does not fulfil the pedagogical norm	8.7%	7,750	0.282	4.9%	2,233	0.216	2.6%	227	0.161
Fulfils the pedagogical norm with dispensation	22.5%	7,750	0.418	31.2%	2,233	0.463	26.9%	227	0.444
FTE Directors	0.84	7,755	0.364	0.978	2,233	0.246	1.123	227	0.292
FTE Pedagogical leaders	4.694	7,754	2.702	7.363	2,233	3.111	8.938	227	3.632
FTE other basic staff	6.061	7,752	3.549	9.487	2,233	4.135	12.056	227	4.979
FTE basic staff in total	10.752	7,755	6.073	16.85	2,233	7.037	20.993	227	8.327

This table presents the summary statistics of the structural variables of the private facility group defined in Table 1. The data is descriptive for all facilities in the period 2016-2019, with the unit of observation being the facility year. The columns are grouped by three, where the columns present means, number of observations and standard deviations for each group. The data is categorised into three groups: independent, largest, and PE-owned. PE-owned facilities are defined in Appendix C, and the largest group are the facilities belonging to the largest kindergarten chains defined in Appendix C. All kindergartens that do not for these definitions are considered independent. The sample size varies slightly as some facilities have not reported on all the data for all the years. The yellow shaded variables are considered key indicators. For a definition of all the variables, please see Appendix F. Facilities not present in the whole period were omitted from the dataset. The indicator Child per Kindergarten Teacher is winsorized at the 0.5% and 99.5% levels.

Table 3: Descriptive Statistics of KPS

Descriptive Statistics

	All			Public			Private		
	Mean	N	SD	Mean	N	SD	Mean	N	SD
Outdoor and indoor environment	4.131	5,912	0.286	4.01	2,766	0.278	4.24	3,146	0.249
Relationship between children and adults	4.523	5,911	0.225	4.46	2,765	0.223	4.58	3,146	0.21
The child's well being	4.748	5,910	0.133	4.71	2,765	0.139	4.78	3,145	0.12
Information	4.254	5,909	0.313	4.17	2,764	0.318	4.33	3,145	0.29
The child's development	4.638	5,910	0.183	4.60	2,765	0.187	4.68	3,145	0.171
Participation	4.249	5,909	0.241	4.19	2,764	0.241	4.30	3,145	0.229
Pickup and delivery	4.381	5,909	0.244	4.33	2,764	0.249	4.43	3,145	0.23
Adaptation and school start	4.473	5,280	0.27	4.42	2,462	0.276	4.52	2,818	0.255
Satisfaction	4.507	5,909	0.264	4.42	2,764	0.266	4.58	3,145	0.24
Number of answers per kindergarten	41.6	6,009	25.056	39.8	2,824	25.018	43.1	3,185	24.993
Response rate	71.6%	6,009	0.159	70.1%	2,824	0.153	73.0%	3,185	0.162

	Independent			Largest Groups			PE-Owned		
	Mean	N	SD	Mean	N	SD	Mean	N	SD
Outdoor and indoor environment	4.27	2023	0.256	4.18	1,106	0.224	4.21	17	0.19
Relationship between children and adults	4.63	2023	0.203	4.50	1,106	0.194	4.39	17	0.208
The child's well being	4.79	2022	0.122	4.76	1,106	0.112	4.72	17	0.101
Information	4.36	2022	0.301	4.27	1,106	0.259	4.18	17	0.305
The child's development	4.69	2022	0.173	4.65	1,106	0.161	4.56	17	0.18
Participation	4.34	2022	0.232	4.24	1,106	0.209	4.15	17	0.207
Pickup and delivery	4.46	2022	0.236	4.37	1,106	0.206	4.30	17	0.173
Adaptation and school start	4.55	1734	0.266	4.47	1,067	0.228	4.41	17	0.198
Satisfaction	4.62	2022	0.236	4.51	1,106	0.23	4.45	17	0.248
Number of answers per kindergarten	35.4	2060	20.521	56.9	1,108	26.201	80.8	17	13.561
Response rate	71.7%	2060	0.165	75.3%	1,108	0.154	75.3%	17	0.123

This table presents the summary statistics of the KPS variables of all the facilities. The data is descriptive for all facilities in the period 2018-2019, with the unit of observation being the facility year. The columns are grouped by three, where the columns present means, number of observations and standard deviations for each group. The data is categorised into six groups, where the upper panel presents all observations, public and private facilities. The lower panel presents the more granular data on private facilities: independent, largest groups and PE owned, as detailed under Table 2. The sample size varies slightly as some facilities have not reported on all the data for all the years. The yellow shaded variables are considered key indicators. For a definition of all the variables, please see Appendix F. Facilities not present in the whole period were omitted from the dataset.

Table 4: T-test Results

	Test Statistic	DF	P-value
A. Structural Indicators			
Kindergarten teacher	-0.738	19980	0.4605
Equivalent to kindergarten teacher	-3.862	20000	0.000113
Other pedagogical education	-11.452	18168	< 2.2E-16
Child Care and Youth Worker	43.956	19713	< 2.2E-16
Other higer educatiom	-17.633	17072	< 2.2E-16
Other skilled worker	7.119	19371	1.13E-12
Other background	-32.881	19953	< 2.2E-16
Number of children	-1.090	19994	0.2758
0 years old	15.721	5296	< 2.2E-16
1 year old	14.022	19035	< 2.2E-16
2 years old	-0.311	19360	0.7557
3 years old	5.386	19340	7.28E-08
4 years old	7.437	19388	1.07E-13
5 years old	14.664	19151	< 2.2E-16
Child per employee	-25.017	18754	< 2.2E-16
Child per kindergarten teacher	-6.436	19760	1.26E-10
Dispensation from educational requirements for pedagogical leaders	-1.985	19984	0.04714
Dispensation from staffing norm	6.886	19190	5.92E-12
Male directors	-1.220	19833	0.2225
Male pedagogical leaders	-13.557	19519	< 2.2E-16
Male other basic staff	-27.498	18498	< 2.2E-16
Male basic staff in total	-28.057	18929	< 2.2E-16
Male directors and basic staff in total	-26.431	19021	< 2.2E-16
Living area per child, sqm	17.257	12930	< 2.2E-16
Opening hours per day	-23.013	18901	< 2.2E-16
Boarding fee	-36.327	18941	< 2.2E-16
Parental payment below maximum	4.092	19479	4.30E-05
Have been supervised	-15.621	19863	< 2.2E-16
Fulfils the pedagogical norm	-0.729	19859	0.4659
Does not fulfil the pedagogical norm	8.454	19242	< 2.2E-16
Fulfils the pedagogical norm with dispensation	-5.113	19848	3.21E-07
FTE Directors	12.977	19343	< 2.2E-16
FTE Pedagogical leaders	-2.615	19860	0.00894
FTE other basic staff	2.011	19644	0.04435
FTE basic staff in total	0.024	19793	0.9812
B. KPS Indicators			
Outdoor and indoor environment	-33.081	5596	< 2.2e-16
Relationship between children and adults	-21.231	5703	< 2.2e-16
The child's well being	-19.488	5501	< 2.2e-16
Information	-19.549	5634	< 2.2e-16
The child's development	-17.079	5633	< 2.2e-16
Participation	-17.878	5723	< 2.2e-16
Pickup and delivery	-16.142	5654	< 2.2e-16
Adaptation and school start	-13.242	5047	< 2.2e-16
Satisfaction	-23.594	5610	< 2.2e-16
Number of answers per kindergarten	-5.087	5920	3.76E-07
Response rate	-7.107	5982	1.32E-12

This table presents a two-sided Welch's T-test between the public and private facilities. The test is done on all the indicators mentioned in Tables 1 and 2. Panel A presents the results on structural data and Panel B on process quality indicators. The null hypothesis is that the difference in means is not significantly different from zero. The first column presents the test statistic, T-stat, the second column is the degrees of freedom, and the last column is the p-value. The null hypothesis is rejected at the 5% level.

Table 5: ANOVA Results

	DF	Sum of Squares	Mean Squares	F-Value	P-Value
A. Structural Indicators					
Kindergarten teacher	2	0	0.002046	0.154	0.857
Equivalent to kindergarten teacher	2	0.08	0.04156	12.79	2.84E-06
Other pedagogical education	2	0.016	0.007867	2.871	0.0567
Child Care and Youth Worker	2	0.44	0.22069	10.44	2.96E-05
Other higer educatiom	2	0.02	0.010944	1.685	0.186
Other skilled worker	2	0.02	0.010944	1.685	0.186
Other background	2	1.65	0.8244	30.27	7.81E-14
Number of children	2	1721234	860617	1080	<2E-16
0 years old	2	0.0493	0.02467	32.32	1.20E-14
1 year old	2	0.01	0.0038	0.765	0.465
2 years old	2	0.01	0.003837	0.831	0.436
3 years old	2	0.03	0.013018	3.7	0.0248
4 years old	2	0.11	0.05532	12.96	2.39E-06
5 years old	2	0.26	0.13218	27.34	1.44E-12
Child per employee	2	296	147.81	443.3	<2E-16
Child per kindergarten teacher	2	1948	973.8	31.53	2.24E-14
Dispensation from educational requirements for pedagogical leaders	2	11.2	5.604	27.43	1.32E-12
Dispensation from staffing norm	2	0.5	0.25101	8.419	0.000222
Male directors	2	0.5	0.25181	3.575	0.028
Male pedagogical leaders	2	0.23	0.11431	4.929	0.00725
Male other basic staff	2	0.18	0.08894	3.826	0.0218
Male basic staff in total	2	0.2	0.09828	7.07	0.000854
Male directors and basic staff in total	2	0.24	0.11932	9.417	8.20E-05
Living area per child, sqm	2	27325	13663	28.22	6.03E-13
Opening hours per day	2	342.7	171.37	634.4	<2E-16
Boarding fee	2	3189749	1594874	123.9	<2E-16
Parental payment below maximum	2	1.1	0.5433	14.1	7.67E-07
Have been supervised	2	0.8	0.3831	1.546	0.213
Fulfils the pedagogical norm	2	5.5	2.7672	12.67	3.19E-06
Does not fulfil the pedagogical norm	2	2.8	1.3769	19.08	5.37E-09
Fulfils the pedagogical norm with dispensation	2	14.3	7.168	39.04	<2E-16
FTE Directors	2	38.7	19.351	167.2	<2E-16
FTE Pedagogical leaders	2	13641	6820	870.1	<2E-16
FTE other basic staff	2	22784	11392	844.9	<2E-16
FTE basic staff in total	2	71692	35846	907.5	<2E-16
B. KPS Indicators					
Outdoor and indoor environment	2	5.68	2.8398	47.24	<2E-16
Relationship between children and adults	2	12.84	6.42	160.2	<2E-16
The child's well being	2	0.84	0.4176	29.55	1.94E-13
Information	2	5.98	2.9908	36.37	2.42E-16
The child's development	2	1.91	0.9538	33.44	4.27E-15
Participation	2	7.22	3.608	71.77	<2E-16
Pickup and delivery	2	6.34	3.171	62.53	<2E-16
Adaptation and school start	2	4.91	2.4565	38.7	<2E-16
Satisfaction	2	8.61	4.304	78.47	<2E-16
Number of answers per kindergarten	2	358923	179462	350.4	<2E-16
Response rate	2	0.99	0.4949	19.02	6.14E-09

This table presents a one-way analysis of variance between the different private groups using the methodology laid out in 5.1.2. The test is done on all the indicators mentioned in Tables 1 and 2. Panel A presents the results on structural data and Panel B on process quality indicators. The null hypothesis is that the difference in means is not significantly different from zero. The first column presents the degrees of freedom. The Sum of squares in the second column gives us the total variation between the group means and overall mean. Column three gives the mean of the sum of squares. The F-value is the test statistic from the F test, and the last column gives the p-value, where this test's confidence level is set at 5%.

Table 6: Tukey Test Results

	Difference	Boundaries (95%) Lower	Upper	P-Value
A. Structural Indicators				
Equivalent to kindergarten teacher				
Independent - Big4	0.007	0.003	0.010	0.000
PE - Big4	-0.002	-0.011	0.008	0.912
PE - Independent	-0.008	-0.017	0.001	0.077
Child Care and Youth Worker				
Independent - Big4	0.016	0.008	0.025	0.000
PE - Big4	0.012	-0.012	0.035	0.488
PE - Independent	-0.005	-0.028	0.018	0.873
Other background				
Independent - Big4	-0.031	-0.041	-0.022	0.000
PE - Big4	-0.008	-0.035	0.019	0.745
PE - Independent	0.023	-0.003	0.049	0.099
Number of children				
Independent - Big4	-28.079	-29.719	-26.438	0.000
PE - Big4	22.030	17.419	26.640	0.000
PE - Independent	50.108	45.672	54.544	0.000
0 years old				
Independent - Big4	0.008	0.005	0.010	0.000
PE - Big4	0.000	-0.006	0.006	0.999
PE - Independent	-0.008	-0.013	-0.002	0.003
3 years old				
Independent - Big4	0.004	0.000	0.007	0.030
PE - Big4	-0.001	-0.011	0.009	0.973
PE - Independent	-0.005	-0.014	0.005	0.470
4 years old				
Independent - Big4	0.008	0.004	0.011	0.000
PE - Big4	-0.002	-0.013	0.008	0.863
PE - Independent	-0.010	-0.020	0.000	0.058
5 years old				
Independent - Big4	0.011	0.007	0.015	0.000
PE - Big4	-0.009	-0.020	0.003	0.163
PE - Independent	-0.020	-0.031	-0.009	0.000
Child per employee				
Independent - Big4	-0.390	-0.423	-0.356	0.000
PE - Big4	0.159	0.065	0.254	0.000
PE - Independent	0.549	0.458	0.640	0.000
Child per kindergarten teacher				
Independent - Big4	-0.946	-1.269	-0.623	0.000
PE - Big4	0.738	-0.170	1.646	0.137
PE - Independent	1.684	0.811	2.558	0.000
Dispensation from educational requirements for pedagogical leaders				
Independent - Big4	-0.083	-0.109	-0.057	0.000
PE - Big4	-0.066	-0.140	0.007	0.088
PE - Independent	0.017	-0.054	0.088	0.847
Dispensation from staffing norm				
Independent - Big4	0.016	0.006	0.026	0.001
PE - Big4	-0.006	-0.034	0.022	0.867
PE - Independent	-0.022	-0.049	0.005	0.130

		Boundaries (95%)		
	Difference	Lower	Upper	P-Value
B. Structural Indicators				
Male directors				
Independent - Big4	-0.015	-0.030	0.001	0.063
PE - Big4	-0.037	-0.081	0.006	0.108
PE - Independent	-0.023	-0.064	0.019	0.417
Male pedagogical leaders				
Independent - Big4	-0.011	-0.020	-0.002	0.013
PE - Big4	-0.022	-0.047	0.003	0.089
PE - Independent	-0.012	-0.036	0.012	0.489
Male other basic staff				
Independent - Big4	-0.008	-0.017	0.001	0.086
PE - Big4	-0.025	-0.050	0.000	0.056
PE - Independent	-0.017	-0.041	0.008	0.242
Male basic staff in total				
Independent - Big4	-0.009	-0.016	-0.002	0.007
PE - Big4	-0.025	-0.044	-0.005	0.008
PE - Independent	-0.016	-0.035	0.003	0.111
Male directors and basic staff in total				
Independent - Big4	-0.010	-0.017	-0.004	0.001
PE - Big4	-0.026	-0.044	-0.007	0.003
PE - Independent	-0.015	-0.033	0.002	0.107
Living area per child, sqm				
Independent - Big4	3.640	2.356	4.925	0.000
PE - Big4	-2.300	-5.909	1.310	0.294
PE - Independent	-5.940	-9.413	-2.467	0.000
Opening hours per day				
Independent - Big4	-0.419	-0.449	-0.389	0.000
PE - Big4	0.187	0.102	0.272	0.000
PE - Independent	0.606	0.524	0.688	0.000
Boarding fee				
Independent - Big4	-39.936	-46.560	-33.313	0.000
PE - Big4	21.156	2.545	39.767	0.021
PE - Independent	61.092	43.182	79.002	0.000
Parental payment below maximum				
Independent - Big4	0.021	0.010	0.032	0.000
PE - Big4	-0.025	-0.057	0.008	0.174
PE - Independent	-0.046	-0.077	-0.015	0.002
Fulfils the pedagogical norm				
Independent - Big4	0.058	0.030	0.085	0.000
PE - Big4	0.075	-0.002	0.151	0.058
PE - Independent	0.017	-0.057	0.091	0.850
Does not fulfil the pedagogical norm				
Independent - Big4	0.036	0.021	0.052	0.000
PE - Big4	-0.025	-0.069	0.019	0.389
PE - Independent	-0.061	-0.103	-0.019	0.002
Fulfils the pedagogical norm with dispensation				
Independent - Big4	-0.094	-0.119	-0.069	0.000
PE - Big4	-0.050	-0.120	0.020	0.217
PE - Independent	0.044	-0.024	0.111	0.282
FTE Directors				
Independent - Big4	-0.122	-0.142	-0.102	0.000
PE - Big4	0.161	0.105	0.217	0.000
PE - Independent	0.283	0.229	0.337	0.000
FTE Pedagogical leaders				
Independent - Big4	-2.562	-2.725	-2.399	0.000
PE - Big4	1.682	1.223	2.141	0.000
PE - Independent	4.244	3.802	4.686	0.000
FTE other basic staff				
Independent - Big4	-3.197	-3.411	-2.983	0.000
PE - Big4	2.797	2.195	3.400	0.000
PE - Independent	5.995	5.415	6.574	0.000
FTE basic staff in total				
Independent - Big4	-5.762	-6.129	-5.396	0.000
PE - Big4	4.479	3.449	5.510	0.000
PE - Independent	10.242	9.250	11.234	0.000

		Boundaries (95%)		
	Difference	Lower	Upper	P-Value
C. KPS Indicators				
Outdoor and indoor environment				
Independent - Big4	0.089	0.068	0.111	0.000
PE - Big4	0.031	-0.109	0.172	0.860
PE - Independent	-0.058	-0.198	0.082	0.598
Relationship between children and adults				
Independent - Big4	0.131	0.113	0.148	0.000
PE - Big4	-0.101	-0.216	0.013	0.096
PE - Independent	-0.232	-0.347	-0.118	0.000
The child's well being				
Independent - Big4	0.033	0.022	0.043	0.000
PE - Big4	-0.040	-0.108	0.028	0.354
PE - Independent	-0.073	-0.141	-0.005	0.032
Information				
Independent - Big4	0.088	0.063	0.114	0.000
PE - Big4	-0.094	-0.259	0.070	0.370
PE - Independent	-0.183	-0.347	-0.019	0.024
The child's development				
Independent - Big4	0.048	0.034	0.063	0.000
PE - Big4	-0.086	-0.183	0.011	0.094
PE - Independent	-0.134	-0.231	-0.038	0.003
Participation				
Independent - Big4	0.098	0.078	0.117	0.000
PE - Big4	-0.091	-0.219	0.038	0.224
PE - Independent	-0.188	-0.316	-0.060	0.002
Pickup and delivery				
Independent - Big4	0.092	0.072	0.112	0.000
PE - Big4	-0.069	-0.198	0.060	0.418
PE - Independent	-0.161	-0.290	-0.033	0.009
Adaptation and school start				
Independent - Big4	0.084	0.061	0.107	0.000
PE - Big4	-0.061	-0.206	0.083	0.582
PE - Independent	-0.145	-0.289	-0.001	0.047
Satisfaction				
Independent - Big4	0.108	0.087	0.128	0.000
PE - Big4	-0.064	-0.198	0.070	0.505
PE - Independent	-0.172	-0.305	-0.038	0.007
Number of answers per kindergarten				
Independent - Big4	-21.551	-23.528	-19.574	0.000
PE - Big4	23.903	10.934	36.872	0.000
PE - Independent	45.454	32.530	58.378	0.000
Response rate				
Independent - Big4	-0.037	-0.051	-0.023	0.000
PE - Big4	0.000	-0.092	0.092	1.000
PE - Independent	0.037	-0.055	0.129	0.615

This table presents the results of Tukey's Honestly Significant Difference (HSD) post-hoc test for pairwise comparisons. The test is done on all the indicators in Table 5 with a p-value >0.05. The null hypothesis is that the difference in means is not significantly different from zero. The first column give the difference in means between the groups. The second and third column gives the lower and upper confidence interval boundaries at a 95%-level. We see the p-value of the test in the last column.

Table 7: Analysis of Change in Legislation

Structural Quality and the Effect of New Norms

A. Decriptive Statistics	All			Public			Private			Independent			Largest Groups		
	Mean	Count	SD	Mean	Count	SD	Mean	Count	SD	Mean	Count	SD	Mean	Count	SD
Child per employee															
Pre	5.95	4,989	0.658	5.81	2,453	0.713	6.08	2,536	0.571	5.97	1,979	0.579	6.45	557	0.343
Intermediate	5.75	5,062	0.669	5.61	2,492	0.748	5.88	2,570	0.553	5.79	2,004	0.569	6.19	566	0.342
Post	5.61	4,939	0.644	5.52	2,478	0.756	5.70	2,461	0.492	5.64	1,905	0.528	5.91	556	0.244
Difference	-0.33	4,823	0.551	-0.29	2,415	0.57	-0.38	2,408	0.527	-0.33	1,870	0.558	-0.54	538	0.359
Child per kindergarten teacher															
Pre	16.26	4,917	4.555	16.10	2,406	4.466	16.42	2,511	4.634	16.18	1,955	4.668	17.28	556	4.413
Intermediate	15.08	5,012	5.585	14.76	2,455	5.134	15.39	2,557	5.97	15.19	1,992	6.087	16.08	565	5.489
Post	14.12	4,892	4.906	13.85	2,444	4.463	14.39	2,448	5.299	14.13	1,884	5.358	15.27	564	5.002
Difference	-2.14	4,730	4.939	-2.22	2,356	4.83	-2.06	2,374	5.046	-2.08	1,829	5.121	-1.99	545	4.789

B. ANOVA	DF	Sum of Squares	Mean Squares	F-Value	P-Value
Child per employee					
Pre	2	187.6	93.82	236.9	<2e-16
Intermediate	2	157.1	78.54	188.6	<2e-16
Post	2	68.3	34.17	85.25	<2e-16
Difference	2	27.3	13.672	45.89	<2e-16
Child per kindergarten teacher					
Pre	2	654	327	15.85	1.37E-07
Intermediate	2	835	417.6	13.46	1.48E-06
Post	2	919	459.7	19.24	4.74E-09
Difference	2	34	16.95	0.695	0.499

C. Tukey HSD	Difference	Boundaries (95%) Lower	Upper	P-Value
Child per employee				
Pre				
Independent - Big4	-0.477	-0.548	-0.407	0
Public - Big4	-0.639	-0.708	-0.570	0
Public - Independent	-0.162	-0.206	-0.117	0
Intermediate				
Independent - Big4	-0.400	-0.472	-0.328	0
Public - Big4	-0.573	-0.644	-0.503	0
Public - Independent	-0.173	-0.218	-0.128	0
Post				
Independent - Big4	-0.268	-0.339	-0.196	0
Public - Big4	-0.382	-0.451	-0.312	0
Public - Independent	-0.114	-0.159	-0.068	0
Difference				
Independent - Big4	0.203	0.140	0.265	0
Public - Big4	0.249	0.188	0.310	0
Public - Independent	0.047	0.007	0.086	0.015
Child per kindergarten teacher				
Pre				
Independent - Big4	-1.103216	-1.615	-0.59148	1E-06
Public - Big4	-1.180494	-1.6815	-0.67949	1E-07
Public - Independent	-0.077278	-0.4015	0.24692	0.8419
Intermediate				
Independent - Big4	-0.883692	-1.5062	-0.26118	0.0025
Public - Big4	-1.3149	-1.9243	-0.7055	1E-06
Public - Independent	-0.431208	-0.825	-0.03737	0.0278
Post				
Independent - Big4	-1.137992	-1.688	-0.58798	4E-06
Public - Big4	-1.416285	-1.9516	-0.88099	0
Public - Independent	-0.278293	-0.6296	0.07302	0.1514

This table presents how the change in legislation affected the key structural indicators in the period 2016-2019. Pre is defined as the period before 2018; intermediate is the transition year of 2018, and post represents the year of 2019. The variable "difference" is the delta between pre and post-legislation. Panel A gives the summary statistics of the effect of change in legislation. The columns are grouped by three, where the columns present means, number of observations and standard deviations for each group. The five groups are as defined as in Table 1 and Table 2. Panel B presents the results of the ANOVA performed between the different groups to analyse if the change in legislation affected the groups differently. The null hypothesis being that the difference in means between groups is not significantly different from zero. The first column presents the degrees of freedom. The Sum of squares in the second column gives us the total variation between the group means and overall mean. Column three gives the mean of the sum of squares. The F-value is the test statistic from the F test, and the last column gives the p-value, where this test's confidence level is set at 5%. Panel C presents the results of the Tukey HSD post-hoc test performed on all indicators, which had a p-value > 0.05 in Panel B. The null hypothesis is that the difference in means is not significantly different from zero. The first column gives the difference in means between the groups. The second and third column gives the lower and upper confidence interval boundaries at a 95%-level. We see the p-value of the test in the last column.

Table 8: Effect of Private versus Public Ownership on Child per Kindergarten Teacher

Effect of Private Ownership on Child per Kindergarten Employee

	Dependent variable:					
	Child per Eemployee					
	OLS		*panel linear*	*OLS*		*panel linear*
	(1)	(2)	(3)	(4)	(5)	(6)
Private	0.244***	0.242***	0.137***			
	(0.010)	(0.016)	(0.013)			
Big Kindergarten			0.057***			0.103***
			(0.013)			(0.022)
Small Kindergarten			-0.269***			-0.186***
			(0.015)			(0.023)
Daily Opening Hours			0.241***			0.005
			(0.023)			(0.053)
Male Directors and Basic Staff			-0.346***			-0.043
			(0.072)			(0.105)
Unemployment rate			0.074***			0.029***
			(0.008)			(0.010)
log(Sqm Price)			0.302***			-0.025
			(0.023)			(0.039)
log(Avg. House Price)			0.035			0.050
			(0.027)			(0.036)
Boarding Fee				0.0003	0.0003	0.0002
					(0.016)	(0.0001)
Constant	5.688***			5.725***		
	(0.008)			(0.008)		
Observations	20,025	20,025	19,746	19,853	19,853	19,746
R^2	0.030	0.031	0.238	0.002	0.0003	0.008
Adjusted R^2	0.030	0.031	0.238	0.002	-0.346	-0.339
Residual Std. Error	0.689 (df = 20023)			0.700 (df = 19851)		
F Statistic	629.256*** (df = 1; 20023)	645.374*** (df = 1; 20020)	771.430*** (df = 8; 19734)	40.824*** (df = 1; 19851)	4.968** (df = 1; 14743)	14.006*** (df = 8; 14639)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Child per Kindergarten Employee and private ownership following the methodology laid out in 6.1. The independent indicator "Private" is a binary variable, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Child per Employee equal to β. A positive increase in the dependent variable is seen as a deterioration in quality, implying more children per employee, hence less time per child. Model 1 and 4 is done using a simple OLS regression, model 2 and 3 is a time-fixed effect model with time effects per year, and models 5 and 6 are time and facility fixed effect models with boarding fees as a proxy for ownership. Models 3 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 9: Effect of Private Ownership on Children per Employee

Private Ownership and Child per Employee

	Dependent variable:					
	Child per Employee					
	(1)	(2)	(3)	(4)	(5)	(6)
Independent	0.046***	0.039***				
	(0.016)	(0.014)				
Big Kindergarten		0.062***		0.026**		0.050***
		(0.014)		(0.013)		(0.013)
Small Kindergarten		-0.255***		-0.236***		-0.246***
		(0.016)		(0.014)		(0.015)
Daily Opening Hours		0.267***		0.230***		0.266***
		(0.024)		(0.024)		(0.024)
Male Directors and Basic Staff		-0.269***		-0.295***		-0.248***
		(0.072)		(0.072)		(0.072)
Unemployment rate		0.081***		0.080***		0.082***
		(0.008)		(0.008)		(0.009)
log(Sqm Price)		0.301***		0.298***		0.301***
		(0.024)		(0.023)		(0.024)
log(Avg. House Price)		0.056**		0.063**		0.063**
		(0.028)		(0.027)		(0.028)
Big 4			0.490***	0.245***		
			(0.014)	(0.016)		
PE-Owned					0.490	0.154***
						(0.030)
Observations	20,025	19,746	20,025	19,746	20,025	19,746
R^2	0.001	0.230	0.051	0.241	0.006	0.230
Adjusted R^2	0.001	0.230	0.051	0.240	0.006	0.229
F Statistic	21.115*** (df = 1; 20020)	736.917*** (df = 8; 19734)	1,071.303*** (df = 1; 20020)	781.646*** (df = 8; 19734)	115.174*** (df = 1; 20020)	736.343*** (df = 8; 19734)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Child per Kindergarten Employee and types of private ownership following the methodology laid out in 6.1. The independent indicator "Independent", "Big 4", and "PE-Owned" are binary variables, which takes the form of 1 if a facility meets the criteria and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Child per Employee equal to β. A positive increase in the dependent variable is seen as a deterioration in quality as it implies more children per employee, hence less time per child. All models are time-fixed effect models with time effects per year. Models 2, 4 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 10: Effect of Private versus Public Ownership on Child per Kindergarten Teacher

Effect of Private Ownership on Child per Kindergarten Teacher

	Dependent variable:					
	Child per Kindergarten Teacher					
	OLS		*panel linear*	*OLS*		*panel linear*
	(1)	(2)	(3)	(4)	(5)	(6)
Private	0.487***	0.475***	0.150			
	(0.076)	(0.114)	(0.111)			
Big Kindergarten			0.346**			0.193
			(0.147)			(0.194)
Small Kindergarten			0.001			-0.373
			(0.123)			(0.285)
Daily Opening Hours			-0.008			0.217
			(0.116)			(0.341)
Male Directors and Basic Staff			-1.218*			1.770*
			(0.648)			(0.905)
Unemployment rate			0.113			-0.013
			(0.077)			(0.104)
log(Sqm Price)			0.501**			0.203
			(0.225)			(0.520)
log(Avg. House Price)			1.387***			0.535
			(0.271)			(0.421)
Boarding Fee				-0.001	0.001	0.001
					(0.114)	(0.001)
Constant	15.196***			15.742***		
	(0.051)			(0.051)		
Observations	19,835	19,835	19,567	19,668	19,668	19,567
R^2	0.002	0.002	0.035	0.0004	0.0001	0.002
Adjusted R^2	0.002	0.002	0.034	0.0003	-0.350	-0.350
Residual Std. Error	5.340 (df = 19833)			5.324 (df = 19666)		
F Statistic	41.305*** (df = 1; 19833)	40.429*** (df = 1; 19830)	88.268*** (df = 8; 19555)	7.734*** (df = 1; 19666)	1.479 (df = 1; 14569)	2.895*** (df = 8; 14471)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Child per Kindergarten Teacher and private ownership following the methodology laid out in 6.1. The independent indicator "Private" is a binary variable, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Child per Kindergarten Teacher equal to β. A positive increase in the dependent variable is seen as a deterioration in quality, implying more children per kindergarten teacher, hence less time per child. Model 1 and 4 is done using a simple OLS regression, model 2 and 3 is a time-fixed effect model with time effects per year, and models 5 and 6 are time and facility fixed effect models with boarding fees as a proxy for ownership. Models 3 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 11: Effect of Private Ownership on Children per Kindergarten Teacher

Private Ownership and Child per Kindergarten Teacher

	Dependent variable:					
	Child per Kindergarten Teacher					
	(1)	(2)	(3)	(4)	(5)	(6)
Independent	-0.007	-0.277**				
	(0.119)	(0.114)				
Big Kindergarten		0.305**		0.217		0.312**
		(0.149)		(0.148)		(0.147)
Small Kindergarten		0.083		0.073		0.028
		(0.124)		(0.123)		(0.123)
Daily Opening Hours		0.035		-0.142		0.006
		(0.115)		(0.114)		(0.114)
Male Directors and Basic Staff		-0.958		-1.306**		-1.102*
		(0.640)		(0.634)		(0.632)
Unemployment rate		0.137*		0.110		0.118
		(0.076)		(0.076)		(0.077)
log(Sqm Price)		0.491**		0.488**		0.502**
		(0.225)		(0.224)		(0.225)
log(Avg. House Price)		1.477***		1.417***		1.416***
		(0.271)		(0.271)		(0.271)
Big 4			1.169***	1.029***		
			(0.179)	(0.181)		
PE-Owned					1.109	0.836*
						(0.486)
Observations	19,835	19,567	19,835	19,567	19,835	19,567
R^2	0.00000	0.035	0.005	0.038	0.001	0.035
Adjusted R^2	-0.0002	0.035	0.005	0.038	0.0003	0.034
F Statistic	0.009 (df = 1; 19830)	89.383*** (df = 8; 19555)	98.659*** (df = 1; 19830)	96.818*** (df = 8; 19555)	9.988*** (df = 1; 19830)	88.529*** (df = 8; 19555)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Child per Kindergarten Teacher and types of private ownership following the methodology laid out in 6.1. The independent indicator "Independent", "Big 4", and "PE-Owned" are binary variables, which takes the form of 1 if a facility meets the criteria and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Child per Kindergarten Teacher equal to β. A positive increase in the dependent variable is seen as a deterioration in quality as it implies more children per kindergarten teacher, hence less time per child. All models are time-fixed effect models with time effects per year. Models 2, 4 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 12: Effect of Private versus Public Ownership on the Relationship Between Children and Adults

Effect of Private Ownership on the Relationship Between Children and Adults

	Dependent variable:					
	Relationship Between Children and Adults					
	OLS	*panel linear*		*OLS*	*panel linear*	
	(1)	(2)	(3)	(4)	(5)	(6)
Private	0.120***	0.120***	0.130***			
	(0.006)	(0.007)	(0.007)			
Big Kindergarten			-0.037***			-0.045*
			(0.008)			(0.024)
Small Kindergarten			0.092***			0.042
			(0.008)			(0.026)
Daily Opening Hours			-0.040***			0.0004
			(0.008)			(0.030)
Male Directors and Basic Staff			0.012			-0.088
			(0.033)			(0.078)
Unemployment rate			-0.005			0.030**
			(0.006)			(0.015)
log(Sqm Price)			-0.052***			0.007
			(0.013)			(0.038)
log(Avg. House Price)			0.051***			0.001
			(0.014)			(0.038)
Boarding Fee				0.0001	-0.0001	-0.0001
					(0.007)	(0.0001)
Constant	4.459***			4.494***		
	(0.004)			(0.004)		
Observations	5,911	5,911	5,746	5,759	5,759	5,746
R^2	0.071	0.071	0.148	0.002	0.0003	0.007
Adjusted R^2	0.071	0.071	0.146	0.002	-1.781	-1.772
Residual Std. Error	0.216 (df = 5909)			0.225 (df = 5757)		
F Statistic	454.349*** (df = 1; 5909)	453.384*** (df = 1; 5908)	124.139*** (df = 8; 5736)	12.562*** (df = 1; 5757)	0.696 (df = 1; 2070)	1.921* (df = 8; 2057)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between the Relationship Between Children and Adults and private ownership following the methodology laid out in 6.1. The independent indicator "Private" is a binary variable, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Relationship Between Children and Adults equal to β. A positive increase in the dependent variable is seen as an improvement in quality, implying a better relationship within the kindergarten facility. Model 1 and 4 is done using a simple OLS regression, model 2 and 3 is a time-fixed effect model with time effects per year, and models 5 and 6 are time and facility fixed effect models with boarding fees as a proxy for ownership. Models 3 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 13: Effect of Private Ownership on the Relationship Between Children and Adults

Private Ownership and the Relationship Between Children and Adults

	Dependent variable:					
	Relationship Between Children and Adults					
	(1)	(2)	(3)	(4)	(5)	(6)
Independent	0.157***	0.141***				
	(0.007)	(0.007)				
Big Kindergarten		-0.016**		-0.037***		-0.035***
		(0.008)		(0.008)		(0.008)
Small Kindergarten		0.083***		0.105***		0.105***
		(0.008)		(0.008)		(0.008)
Daily Opening Hours		-0.002		-0.002		-0.001
		(0.008)		(0.009)		(0.008)
Male Directors and Basic Staff		0.042		0.107***		0.108***
		(0.033)		(0.034)		(0.034)
Unemployment rate		-0.010		-0.003		-0.004
		(0.006)		(0.006)		(0.006)
log(Sqm Price)		-0.050***		-0.067***		-0.067***
		(0.012)		(0.013)		(0.013)
log(Avg. House Price)		0.049***		0.090***		0.090***
		(0.014)		(0.015)		(0.015)
Big 4			-0.034***	0.002		
			(0.008)	(0.009)		
PE-Owned					-0.133	-0.116**
						(0.057)
Observations	5,911	5,746	5,911	5,746	5,911	5,746
R^2	0.111	0.154	0.003	0.074	0.001	0.075
Adjusted R^2	0.110	0.153	0.003	0.073	0.001	0.073
F Statistic	734.253*** (df = 1; 5908)	130.450*** (df = 8; 5736)	20.392*** (df = 1; 5908)	57.526*** (df = 8; 5736)	5.929** (df = 1; 5908)	58.013*** (df = 8; 5736)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between the Relationship Between Children and Adults and types of private ownership following the methodology laid out in 6.1. The independent indicator "Independent", "Big 4", and "PE-Owned" are binary variables, which takes the form of 1 if a facility meets the criteria and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Relationship Between Children and Adults equal to β. A positive increase in the dependent variable is seen as an improvement in quality, implying a better relationship within the kindergarten facility. All models are time-fixed effect models with time effects per year. Models 2, 4 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 14: Effect of Private versus Public Ownership on Children's Development

Effect of Private Ownership on the Children's Development

	Dependent variable:					
	The Child's Development					
	OLS		*panel linear*	*OLS*		*panel linear*
	(1)	(2)	(3)	(4)	(5)	(6)
Private	0.080***	0.080***	0.086***			
	(0.005)	(0.006)	(0.006)			
Big Kindergarten			-0.010			-0.023
			(0.006)			(0.018)
Small Kindergarten			0.042***			0.019
			(0.007)			(0.019)
Daily Opening Hours			-0.011			0.008
			(0.007)			(0.026)
Male Directors and Basic Staff			-0.025			-0.017
			(0.029)			(0.078)
Unemployment rate			-0.008			0.003
			(0.005)			(0.014)
log(Sqm Price)			-0.065***			0.012
			(0.011)			(0.032)
log(Avg. House Price)			0.036***			0.023
			(0.012)			(0.030)
Boarding Fee				0.0001	-0.0001	-0.0001
					(0.006)	(0.0001)
Constant	4.595***			4.601***		
	(0.004)			(0.004)		
Observations	5,910	5,910	5,745	5,758	5,758	5,745
R^2	0.048	0.047	0.089	0.005	0.001	0.002
Adjusted R^2	0.047	0.047	0.087	0.005	-1.781	-1.787
Residual Std. Error	0.179 (df = 5908)			0.183 (df = 5756)		
F Statistic	295.184*** (df = 1; 5908)	293.275*** (df = 1; 5907)	69.606*** (df = 8; 5735)	28.602*** (df = 1; 5756)	1.049 (df = 1; 2069)	0.618 (df = 8; 2056)

Note: *p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Children's Development and private ownership following the methodology laid out in 6.1. The independent indicator "Private" is a binary variable, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Children's Development equal to β. A positive increase in the dependent variable is seen as an improvement in quality, implying the children develop better in the parents' eyes. Model 1 and 4 is done using a simple OLS regression, model 2 and 3 is a time-fixed effect model with time effects per year, and models 5 and 6 are time and facility fixed effect models with boarding fees as a proxy for ownership. Models 3 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 15: Effect of Private Ownership on the Children's Development

Private Ownership and the Children's Development

	Dependent variable:					
	The Child's Development					
	(1)	(2)	(3)	(4)	(5)	(6)
Independent	0.084***	0.081***				
	(0.006)	(0.006)				
Big Kindergarten		0.002		-0.013**		-0.009
		(0.006)		(0.006)		(0.006)
Small Kindergarten		0.038***		0.052***		0.050***
		(0.007)		(0.007)		(0.007)
Daily Opening Hours		0.014**		0.008		0.015**
		(0.006)		(0.007)		(0.007)
Male Directors and Basic Staff		0.0004		0.033		0.039
		(0.029)		(0.029)		(0.029)
Unemployment rate		-0.010**		-0.006		-0.007
		(0.005)		(0.005)		(0.005)
log(Sqm Price)		-0.066***		-0.076***		-0.076***
		(0.011)		(0.011)		(0.011)
log(Avg. House Price)		0.038***		0.062***		0.062***
		(0.012)		(0.013)		(0.013)
Big 4			0.008	0.022***		
			(0.007)	(0.008)		
PE-Owned					-0.087**	-0.111**
					(0.043)	(0.049)
Observations	5,910	5,745	5,910	5,745	5,910	5,745
R^2	0.047	0.080	0.0003	0.042	0.001	0.041
Adjusted R^2	0.047	0.078	-0.00003	0.040	0.0003	0.039
F Statistic	292.387*** (df = 1; 5907)	62.142*** (df = 8; 5735)	1.807 (df = 1; 5907)	31.153*** (df = 8; 5735)	3.792* (df = 1; 5907)	30.424*** (df = 8; 5735)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Children's Development and types of private ownership following the methodology laid out in 6.1. The independent indicator "Independent", "Big 4", and "PE-Owned" are binary variables, which takes the form of 1 if a facility meets the criteria and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in the Children's Development equal to β. A positive increase in the dependent variable is seen as an improvement in quality, implying the children develop better in the parents' eyes. All models are time-fixed effect models with time effects per year. Models 2, 4 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 16: Effect of Private versus Public Ownership on Overall Satisfaction

Effect of Private Ownership on Overall Satisfaction

	Dependent variable:					
	Satisfaction					
	OLS	*panel linear*		*OLS*	*panel linear*	
	(1)	(2)	(3)	(4)	(5)	(6)
Private	0.156***	0.156***	0.160***			
	(0.007)	(0.008)	(0.008)			
Big Kindergarten			-0.004			-0.036
			(0.009)			(0.025)
Small Kindergarten			0.050***			0.019
			(0.010)			(0.027)
Daily Opening Hours			-0.034***			-0.017
			(0.010)			(0.033)
Male Directors and Basic Staff			0.071*			-0.054
			(0.042)			(0.091)
Unemployment rate			-0.013*			0.040**
			(0.007)			(0.019)
log(Sqm Price)			-0.082***			-0.039
			(0.016)			(0.042)
log(Avg. House Price)			0.080***			-0.026
			(0.017)			(0.040)
Boarding Fee				0.0003	0.0001	0.0001
					(0.008)	(0.0001)
Constant	4.424***			4.428***		
	(0.005)			(0.005)		
Observations	5,909	5,909	5,744	5,757	5,757	5,744
R^2	0.087	0.087	0.112	0.011	0.0001	0.007
Adjusted R^2	0.087	0.087	0.111	0.011	-1.782	-1.774
Residual Std. Error	0.252 (df = 5907)			0.263 (df = 5755)		
F Statistic	564.040*** (df = 1; 5907)	562.357*** (df = 1; 5906)	90.785*** (df = 8; 5734)	65.811*** (df = 1; 5755)	0.244 (df = 1; 2069)	1.767* (df = 8; 2056)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Satisfaction and private ownership following the methodology laid out in 6.1. The independent indicator "Private" is a binary variable, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in Satisfaction equal to β. Model 1 and 4 is done using a simple OLS regression, model 2 and 3 is a time-fixed effect model with time effects per year, and models 5 and 6 are time and facility fixed effect models with boarding fees as a proxy for ownership. Models 3 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 17: Effect of Private Ownership on Overall Satisfaction

Private Ownership and Overall Satisfaction

	Dependent variable:					
	Satisfaction					
	(1)	(2)	(3)	(4)	(5)	(6)
Independent	0.170***	0.163***				
	(0.008)	(0.009)				
Big Kindergarten		0.020**		-0.007		-0.003
		(0.009)		(0.010)		(0.010)
Small Kindergarten		0.040***		0.067***		0.065***
		(0.010)		(0.010)		(0.010)
Daily Opening Hours		0.013		0.008		0.014
		(0.009)		(0.010)		(0.010)
Male Directors and Basic Staff		0.113***		0.184***		0.190***
		(0.042)		(0.044)		(0.043)
Unemployment rate		-0.018**		-0.010		-0.010
		(0.007)		(0.007)		(0.007)
log(Sqm Price)		-0.081***		-0.101***		-0.101***
		(0.016)		(0.017)		(0.017)
log(Avg. House Price)		0.080***		0.127***		0.127***
		(0.017)		(0.018)		(0.018)
Big 4			0.005	0.019*		
			(0.010)	(0.011)		
PE-Owned					-0.066	-0.122*
						(0.064)
Observations	5,909	5,744	5,909	5,744	5,909	5,744
R^2	0.093	0.109	0.0001	0.033	0.0002	0.033
Adjusted R^2	0.093	0.108	-0.0003	0.031	-0.0002	0.031
F Statistic	608.086*** (df = 1; 5906)	87.712*** (df = 8; 5734)	0.316 (df = 1; 5906)	24.350*** (df = 8; 5734)	1.065 (df = 1; 5906)	24.211*** (df = 8; 5734)

Note: *p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Satisfaction and types of private ownership following the methodology laid out in 6.1. The independent indicator "Independent", "Big 4", and "PE-Owned" are binary variables, which takes the form of 1 if a facility meets the criteria and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in parental Satisfaction equal to β. A positive increase in the dependent variable is seen as an improvement in quality, implying the parents are more satisfied with the kindergarten as a whole. All models are time-fixed effect models with time effects per year. Models 2, 4 and 6 have control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators on postcode and county levels. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. The interpretation of housing price variables is that a 1% in housing prices is associated with a change in the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Table 18: Effect of Private Ownership on Overall Satisfaction Dependent on Location

Effect of Private Ownership on Satisfaction Based on Location

	Dependent variable:					
	Satisfaction					
	Whole Country	Within Cities	Outside of Cities	High Prices in Cities	Low Prices in Cities	Low sqm Prices in Cities
	(1)	(2)	(3)	(4)	(5)	(6)
Private	0.155***	0.169***	0.144***	0.182***	0.161***	0.151***
	(0.008)	(0.014)	(0.010)	(0.016)	(0.030)	(0.041)
Big Kindergarten	-0.006	0.012	-0.021*	0.003	0.036	0.091***
	(0.009)	(0.014)	(0.012)	(0.016)	(0.027)	(0.035)
Small Kindergarten	0.049***	0.036**	0.056***	0.027	0.048	0.083*
	(0.009)	(0.018)	(0.011)	(0.020)	(0.039)	(0.050)
Daily Opening Hours	-0.034***	-0.061***	-0.019*	-0.056***	-0.097**	-0.153**
	(0.009)	(0.017)	(0.012)	(0.017)	(0.046)	(0.063)
Male Directors and Basic Staff	0.080**	0.098*	0.070	0.082	0.114	0.302**
	(0.040)	(0.059)	(0.057)	(0.065)	(0.118)	(0.150)
Unemployment rate	-0.015**	-0.020	-0.013			
	(0.007)	(0.020)	(0.009)			
Price in Upper Percentile	0.033	0.042*	0.003			
	(0.020)	(0.024)	(0.042)			
Price in Lower Percentile	-0.049**	-0.065**	-0.014			
	(0.023)	(0.026)	(0.047)			
Square Meter Price in Upper Quartile	-0.0002	-0.029	0.021			
	(0.014)	(0.022)	(0.018)			
Square Meter Price in Lower Quartile	-0.056***	-0.066***	-0.046			
	(0.019)	(0.023)	(0.035)			
Observations	5,744	2,132	3,612	1,464	668	449
R^2	0.127	0.190	0.088	0.149	0.083	0.132
Adjusted R^2	0.125	0.186	0.085	0.145	0.075	0.120
F Statistic	83.077*** (df = 10; 5732)	49.721*** (df = 10; 2120)	34.594*** (df = 10; 3600)	50.883*** (df = 5; 1457)	11.997*** (df = 5; 661)	13.472*** (df = 5; 442)
Note:						*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Satisfaction and private ownership following the methodology laid out in 6.1. The data are grouped by location, where column 1 is the overall data, column 2 is facilities within the counties defined as cities in Appendix E, and column 3 is facilities outside those cities. Columns 4 and 5 are facilities within cities but in areas with relatively high and low prices, and column 6 are facilities in areas in cities with square meter prices. A high or low price is determined as a postcode area within a county, either in the upper or lower quartile within that same county, respectively. The independent indicator "Private" is a binary variable, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in Satisfaction equal to β. All models are time-fixed effect models using control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators at the county level. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. Housing price indicators are binary variables; if a facility is in a postcode area meeting criteria, this corresponds to an increase in Satisfaction equal to β. Standard errors are clustered by facility.

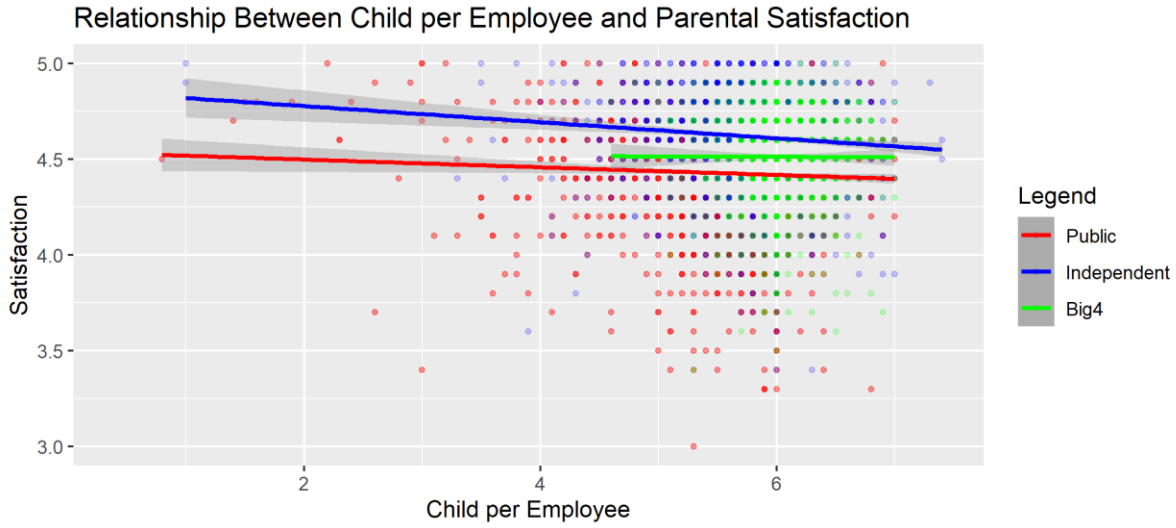
Table 19: Effect of Private Ownership on Overall Satisfaction within Cities

Effect of Private Ownership Within Cities on Satisfaction

	Dependent variable:			
	Satisfaction			
	Upper Quartile Price	Lower Quartile Price	Upper Quartile m2 Price	Lower Quartile m2 Price
	(1)	(2)	(3)	(4)
Independent	0.198***	0.168***	0.163***	0.185***
	(0.017)	(0.049)	(0.037)	(0.047)
Largest Groups	0.145***	0.089*	0.050	0.053
	(0.024)	(0.047)	(0.071)	(0.050)
Big Kindergarten	0.012	0.088***	-0.002	0.093***
	(0.017)	(0.033)	(0.039)	(0.034)
Small Kindergarten	0.023	0.071	0.043	0.073
	(0.020)	(0.053)	(0.042)	(0.051)
Daily Opening Hours	-0.046***	-0.067	-0.145**	-0.125**
	(0.018)	(0.054)	(0.063)	(0.061)
Male Directors and Basic Staff	0.071	0.266*	0.112	0.302**
	(0.065)	(0.155)	(0.137)	(0.150)
Observations	1,464	415	344	449
R^2	0.153	0.084	0.160	0.142
Adjusted R^2	0.149	0.069	0.143	0.129
F Statistic	43.787*** (df = 6; 1456)	6.248*** (df = 6; 407)	10.699*** (df = 6; 336)	12.184*** (df = 6; 441)
Note:				*p<0.1; **p<0.05; ***p<0.01

This table presents the estimates of the relationship between Satisfaction and types of private ownership following the methodology laid out in 6.1. Housing price criteria group the data within the cities defined in Appendix E. Columns 1 and 2 show the facilities within cities that are either in the postcode areas within the upper or lower price quartile, respectively. Columns 3 and 4 show the cities' facilities in the postcode areas within the upper or lower square meter price quartile, respectively. The independent indicator "Independent" and "Largest Groups" are binary variables, which takes the form of 1 if a facility is private and 0 otherwise. Hence, if the ownership indicator is 1, this corresponds to an increase in Satisfaction equal to β. All models are time-fixed effect models using control variables denoted as the vectors $C_{i,t}$ and $S_{i,t}$ in 6.1; this includes structural variables on facility levels and socioeconomic indicators at the county level. The indicator "Big Kindergarten" and "Small Kindergarten" corresponds to a binary indicator with thresholds of 80 and 45 children, respectively. "Daily Opening Hours" is interpreted as if the facility extended its opening hour by one hour; it would affect the dependent variable equal to the coefficient value. The "Male Directors and Basic Staff" coefficient implies an increase in the share of male staff by 100 percentage points; hence, an increase in the male staff of 1 percentage point would imply an effect equal to the coefficient divided by 100 on the dependent variable. The interpretation of the unemployment rate is that an increase in the unemployment rate of 1 percentage point affects the dependent variable equal to the coefficient. Standard errors are clustered by facility.

Figure 1: Relationship Between Children per Employee and Process Quality

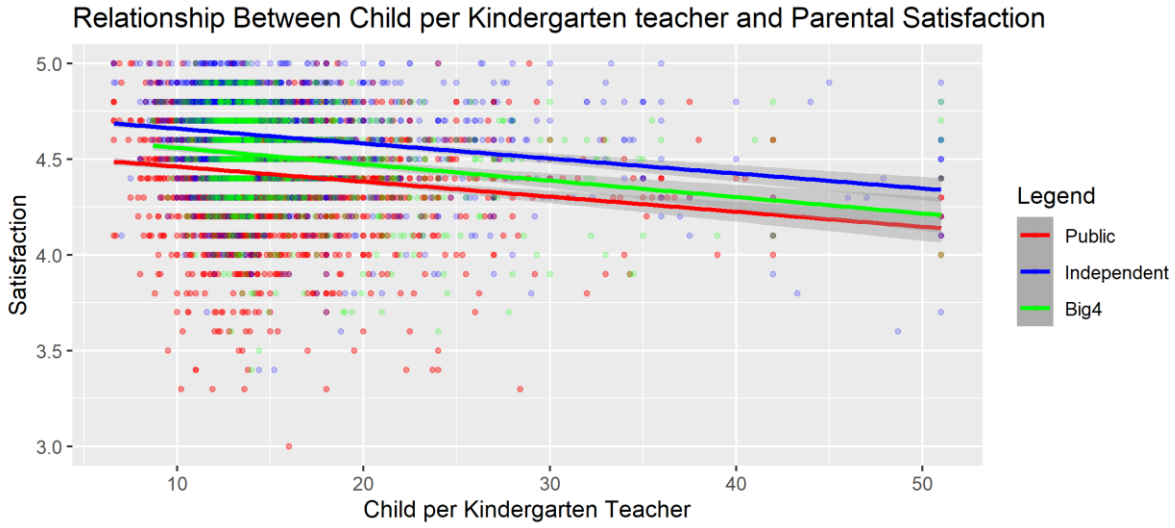


Relationship Between Child per Employee and Parental Satisfaction

	Dependent variable:		
	Satisfaction		
	Public	Independent	Big4
	(1)	(2)	(3)
Child per Employee	-0.020*	-0.042***	-0.002
	(0.011)	(0.012)	(0.026)
Constant	4.539***	4.862***	4.523***
	(0.061)	(0.069)	(0.157)
Observations	2,750	1,971	1,089
R^2	0.002	0.008	0.00001
Adjusted R^2	0.002	0.007	-0.001
Residual Std. Error	0.265 (df = 2748)	0.236 (df = 1969)	0.231 (df = 1087)
F Statistic	5.222** (df = 1; 2748)	15.006*** (df = 1; 1969)	0.006 (df = 1; 1087)
Note:			*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's level of children per employee and parental satisfaction in the period 2018 and 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. Models 1, 2 and 3 are all OLS models are restricted to only public, independent and largest group facilities, respectively. The interpretation is that an increase in the Child per Employee of one unit would cause a deterioration in Satisfaction equal to β. Standard errors are clustered by facility.

Figure 2: Relationship Between Children per Kindergarten Teacher and Process Quality

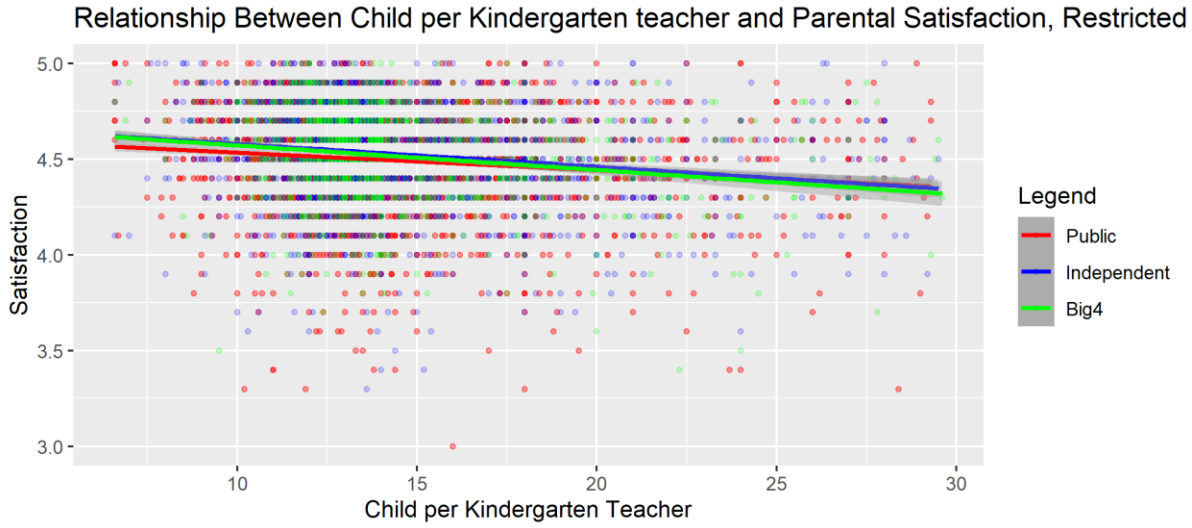


Relationship Between Child per Kindergarten Teacher and Parental Satisfaction

	Dependent variable:		
	Satisfaction		
	Public	Independent	Big4
	(1)	(2)	(3)
Child per Kindergarten Teacher	-0.008***	-0.008***	-0.009***
	(0.001)	(0.001)	(0.002)
Constant	4.540***	4.738***	4.645***
	(0.016)	(0.017)	(0.027)
Observations	2,735	1,959	1,094
R^2	0.020	0.039	0.037
Adjusted R^2	0.020	0.039	0.036
Residual Std. Error	0.262 (df = 2733)	0.231 (df = 1957)	0.226 (df = 1092)
F Statistic	56.630*** (df = 1; 2733)	79.958*** (df = 1; 1957)	42.283*** (df = 1; 1092)
Note:			*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's level of children per kindergarten teacher and parental satisfaction in the period 2018 and 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. Models 1, 2 and 3 are all OLS models are restricted to only public, independent and largest group facilities, respectively. The interpretation is that an increase in the Child per Kindergarten Teacher of one unit would cause a deterioration in Satisfaction equal to β. Standard errors are clustered by facility. The independent variable is winsorized at 0.5% and 99.5%.

Figure 3: Relationship Between Children per Kindergarten Teacher and Process Quality, Restricted

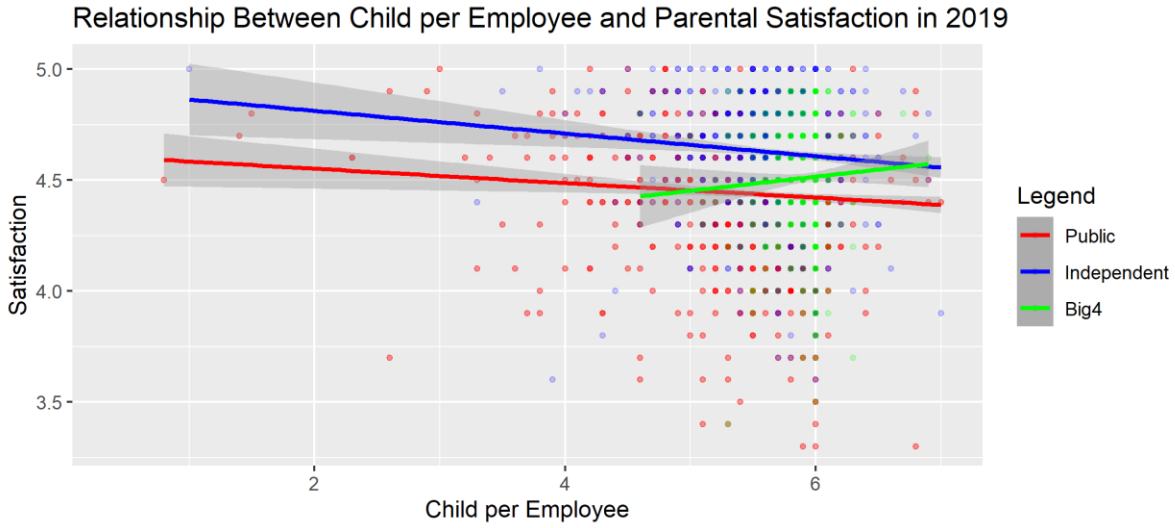


Relationship Between Child per Kindergarten Teacher and Parental Satisfaction, ex Obs >30

	Dependent variable:		
	Satisfaction		
	Public	Independent	Big4
	(1)	(2)	(3)
Child per Kindergarten Teacher	-0.009***	-0.012***	-0.013***
	(0.002)	(0.002)	(0.002)
Constant	4.625***	4.700***	4.701***
	(0.023)	(0.025)	(0.036)
Observations	2,689	1,947	1,011
R^2	0.015	0.029	0.036
Adjusted R^2	0.015	0.029	0.035
Residual Std. Error	0.268 (df = 2687)	0.255 (df = 1945)	0.242 (df = 1009)
F Statistic	40.953*** (df = 1; 2687)	58.884*** (df = 1; 1945)	37.858*** (df = 1; 1009)
Note:			*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's level of children per kindergarten teacher and parental satisfaction in the period 2018 and 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. Models 1, 2 and 3 are all OLS models are restricted to only public, independent and largest group facilities, respectively. The interpretation is that an increase in the Child per Kindergarten Teacher of one unit would cause a deterioration in Satisfaction equal to β. Standard errors are clustered by facility. The independent variable is winsorized at 0.5% and 99.5% and restricted upwards to 30 children per kindergarten teacher.

Figure 4: Relationship Between Children per Employee and Process Quality in 2019

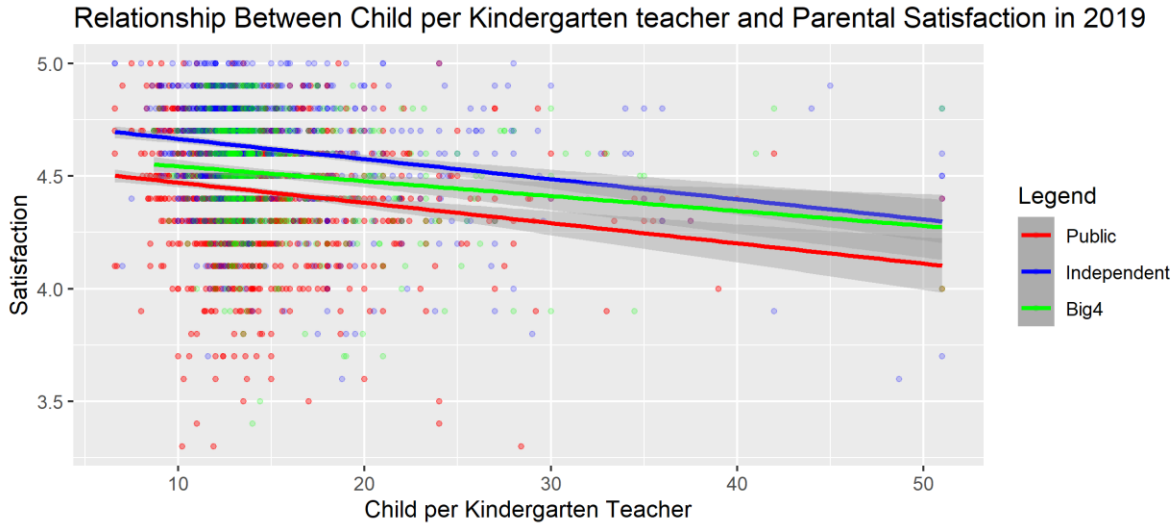


Relationship Between Child per Employee and Parental Satisfaction in 2019

	Dependent variable:		
	Satisfaction		
	Public	Independent	Big4
	(1)	(2)	(3)
Child per Employee	-0.033**	-0.051**	0.064
	(0.014)	(0.021)	(0.068)
Constant	4.617***	4.915***	4.134***
	(0.081)	(0.121)	(0.401)
Observations	1,324	970	541
R^2	0.005	0.009	0.003
Adjusted R^2	0.004	0.008	0.001
Residual Std. Error	0.265 (df = 1322)	0.239 (df = 968)	0.236 (df = 539)
F Statistic	6.808*** (df = 1; 1322)	8.646*** (df = 1; 968)	1.404 (df = 1; 539)
Note:			*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's level of children per kindergarten teacher and parental satisfaction in 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. Models 1, 2 and 3 are all OLS models are restricted to only public, independent and largest group facilities, respectively. The interpretation is that an increase in the Child per Kindergarten Teacher of one unit would cause a deterioration in Satisfaction equal to β. Standard errors are clustered by facility. The independent variable is winsorized at 0.5% and 99.5% and restricted upwards to 30 children per kindergarten teacher.

Figure 5: Relationship Between Children per Kindergarten Teacher and Process Quality in 2019

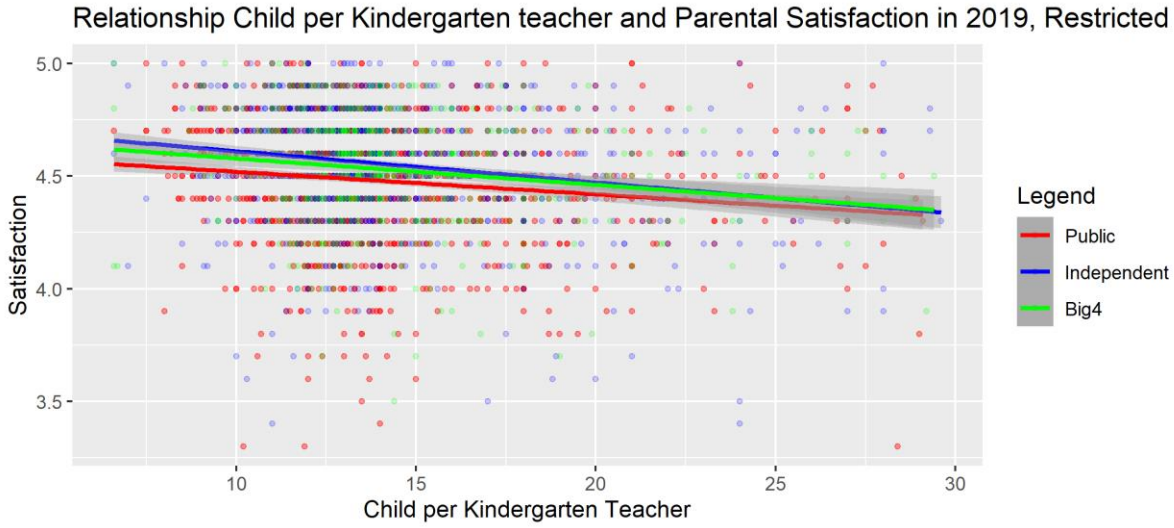


Relationship Between Child per Kindergarten Teacher and Parental Satisfaction in 2019

	Dependent variable:		
	Satisfaction		
	Public	Independent	Big4
	(1)	(2)	(3)
Child per Kindergarten Teacher	-0.009***	-0.009***	-0.007**
	(0.002)	(0.002)	(0.003)
Constant	4.562***	4.755***	4.610***
	(0.026)	(0.028)	(0.041)
Observations	1,316	964	547
R^2	0.022	0.045	0.019
Adjusted R^2	0.021	0.044	0.017
Residual Std. Error	0.261 (df = 1314)	0.232 (df = 962)	0.233 (df = 545)
F Statistic	29.655*** (df = 1; 1314)	44.876*** (df = 1; 962)	10.485*** (df = 1; 545)
Note:			*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's level of children per kindergarten teacher and parental satisfaction in 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. Models 1, 2 and 3 are all OLS models are restricted to only public, independent and largest group facilities, respectively. The interpretation is that an increase in the Child per Kindergarten Teacher of one unit would cause a deterioration in Satisfaction equal to β. Standard errors are clustered by facility. The independent variable is winsorized at 0.5% and 99.5%.

Figure 6: Relationship Between Children per Kindergarten Teacher and Process Quality in 2019, Restricted

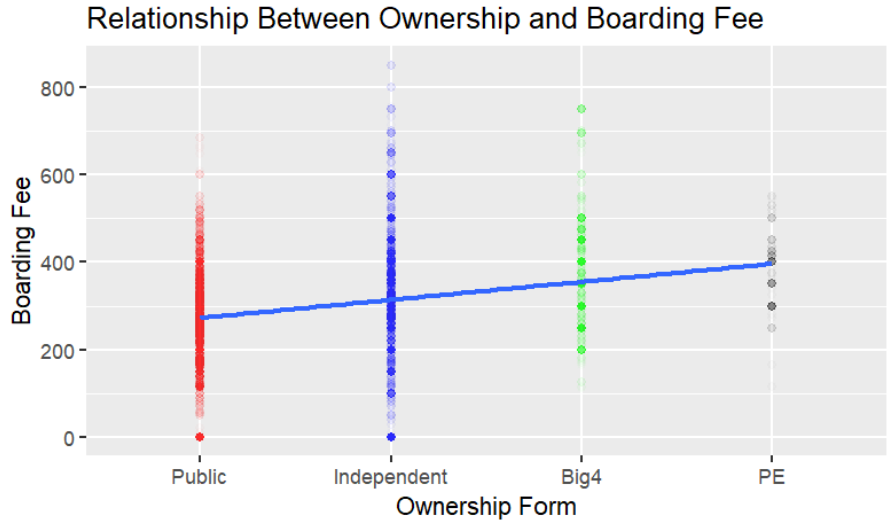


Relationship Between Child per Kindergarten Teacher and Parental Satisfaction in 2019, ex Obs >30

	Dependent variable:		
	Satisfaction		
	Public	Independent	Big4
	(1)	(2)	(3)
Child per Kindergarten Teacher	-0.010***	-0.014***	-0.012***
	(0.002)	(0.003)	(0.003)
Constant	4.620***	4.749***	4.695***
	(0.034)	(0.041)	(0.045)
Observations	1,293	972	507
R^2	0.016	0.037	0.030
Adjusted R^2	0.016	0.036	0.028
Residual Std. Error	0.266 (df = 1291)	0.252 (df = 970)	0.243 (df = 505)
F Statistic	21.629*** (df = 1; 1291)	36.932*** (df = 1; 970)	15.678*** (df = 1; 505)
Note:			*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's level of children per kindergarten teacher and parental satisfaction in 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. Models 1, 2 and 3 are all OLS models are restricted to only public, independent and largest group facilities, respectively. The interpretation is that an increase in the Child per Kindergarten Teacher of one unit would cause a deterioration in Satisfaction equal to β. Standard errors are clustered by facility. The independent variable is winsorized at 0.5% and 99.5% and restricted upwards to 30 children per kindergarten teacher.

Figure 7: Relationship Ownership Form and Boarding Fee



Relationship Between Ownership Form and Boarding Fee

	Dependent variable:
	Boarding_fee Proxy
Ownership Form (1:4)	41.241***
	(1.023)
Constant	231.303***
	(1.819)
Observations	19,869
R^2	0.076
Adjusted R^2	0.076
Residual Std. Error	102.632 (df = 19867)
F Statistic	1,625.856*** (df = 1; 19867)
Note:	*p<0.1; **p<0.05; ***p<0.01

The table shows the relationship between a facility's ownership form and the level of boarding fees period 2016 and 2019 for different ownership types. The darker the dot, the more observations are present at this level. Ownership forms are differentiated by colour. The regression of the corresponding ablines is seen in the table below. The regression model is an OLS model. The dependent variable is discrete and can take the form of either 1, 2, 3 or 4, representing whether a facility is public, independent, largest group or PE-owned, respectively. The dependent variable's interpretation is that a unit increase, hence a change in ownership form, would imply an increase in boarding fees equal to β. The constant bear no significant meaning as it assumes a dependent variable equal to 0. Standard errors are clustered by facility.

Appendix

Appendix A – Kindergarten Parental Survey

Translated version of the KPS (The Norwegian Directorate for Education and Training , 2019)

Background

Child's gender

Answer option: Boy – Girl

Child's age

Response alternative: 0 years – 1 year – 2 years – 3 years – 4 years – 5 or 6 years

Does the child have a mother tongue other than Norwegian?

Answer option: Yes – No

Outdoor and indoor environment

How satisfied or dissatisfied are you with the kindergarten's outdoor areas?

Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied –Quite dissatisfied – Very dissatisfied – Don't know

How satisfied or dissatisfied are you with the kindergarten premises?

Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

How satisfied or dissatisfied are you with the kindergarten's toys and equipment?

Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

How satisfied or dissatisfied are you with hygiene in kindergarten?

Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

How satisfied or dissatisfied are you with the kindergarten's food offer?

Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

How satisfied or dissatisfied are you with how the kindergarten ensures the children's safety?

Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

Relationship between child and adult

How much you agree or disagree with the following statement:

I find that my child feels safe with the staff in the kindergarten.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I find that the staff takes into account my child's needs.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I find that the employees are engaged with my child.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partly disagree – Strongly disagree – Don't know

I find that the staff density – the number of children per adult – in kindergarten is satisfactory.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

Child well-being

How much you agree or disagree with the following statement:

I have the impression that my child thrives in kindergarten.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I have the impression that my child has friends in kindergarten.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I have the impression that kindergarten facilitates versatile play and activities.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

Information

How much you agree or disagree with the following statement:

I get good information from the staff about how my child is doing in kindergarten.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I get good information about the content of the kindergarten day.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

The kindergarten is good at informing about any changes in the staff group.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

Child development

How much you agree or disagree with the following statement:

I experience having a good dialogue with the kindergarten about my child's development.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I have the impression that kindergarten contributes to my child's social development (friendship, empathy, showing consideration).
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

I have the impression that the staff in the kindergarten encourages my child's curiosity and desire to learn.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partly disagree – Strongly disagree – Don't know

I have the impression that kindergarten facilitates my child's language development.

Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

Cooperation

How much you agree or disagree with the following statement:

I have the impression that my child gets to influence the content of the kindergarten day.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

The nursery takes my views into account.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

The kindergarten works to ensure parents' participation.
Answer alternative: Strongly agree – Partially agree – Neither agree nor disagree – Partially disagree – Strongly disagree – Don't know

Pick-up and delivery

Does the kindergarten invite parents to meetings?
Answer option: Yes – No

If so: Do you find parent meetings helpful?
Answer option: Very useful – Quite useful – Neither useful nor useless – A bit useful – Not useful – Don't know

How satisfied or dissatisfied are you with how the staff meets you when delivering children?
Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

How satisfied or dissatisfied are you with how the staff meets you when picking up children?
Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

Adaptation and start of school

Should your child start school in the fall?
Answer option: Yes – No

How satisfied or dissatisfied are you with how kindergarten prepares your child for school start?
Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

Has your child started kindergarten for the first time or changed their ward/base within the past year?
Answer option: Yes – No

If so, how satisfied or dissatisfied are you with how your child was cared for during the adaptation period?
Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

Satisfaction

Overall, how satisfied or dissatisfied are you with your day-care?
Answer option: Very satisfied – Quite satisfied – Neither satisfied nor dissatisfied – Quite dissatisfied – Very dissatisfied – Don't know

Appendix B – The Four Largest Kindergarten Groups in Norway and Their Kindergartens

Læringsverkstedet	FUS	Espira/ AcadeMedia	Norlandia
Læringsverkstedet barnehage Avd Sundbakken	Søre Neset Fus barnehage AS	Espira Aarkjær Barnehage	Norlandia Tre Troll barnehage
Læringsverkstedet barnehage Avd Gonveien	Vikedal Fus barnehage AS	Espira Arcen barnehage	Norlandia Breivika kulturbarnehage
Læringsverkstedet barnehage Avd Havfrua	Lande Fus barnehage AS	Espira Baggerødbanen Barnehage	Norlandia Nissebo barnehage
Læringsverkstedet barnehage Avd Haga	Ostereidet Fus barnehage AS	Espira Bjørgene barnehage	Norlandia Svanevågen Gårds- og Friluftsbarnehage AS
Læringsverkstedet Maurtua AS	Østmarkskollen Fus barnehage AS	Espira Blakstad barnehage	Norlandia Neskollen Tellusvegen barnehage
Læringsverkstedet barnehage Avd Åkrasanden	Sennerud Fus barnehage	Espira Brådalsfjellet barnehage	Norlandia Linnesbakken sprelloppbarnehage
Læringsverkstedet barnehage Avd Eid	Utsikten Vest Fus barnehage AS	Espira Bråsteintunet Barnehage	Norlandia Capella barnehage

Læringsverkstedet barnehage Avd Solkollen Skatval	Robåten Fus barnehage AS	Espira Bråsteintunet Barnehage	Norlandia Romsaas barnehage
Læringsverkstedet barnehage Avd Ilseng	Mjær Fus barnehage AS	Espira Dragerskogen barnehage	Norlandia Tusseladden barnehage
Læringsverkstedet barnehage Avd Vennesla	Fjellheim Fus friluftsbarnehage	Espira Dvergsnes barnehage	Norlandia Isbjørnen barnehage
Læringsverkstedet barnehage Solkollen Avd. Slotsvik	Knausen Fus barnehage AS	Espira Eikenga barnehage	Norlandia Kårtveitpollen barnehage
Læringsverkstedet Bratteberg barnehage AS	Kåreviksmarka Fus barnehage	Espira Eikenøtta naturbarnehage AS	Norlandia Stadionparken barnehage
Læringsverkstedet barnehage Avd Kaldvell	Tyristubben Fus barnehage AS	Espira Evangtunet Barnehage	Norlandia Valhall barnehage
Læringsverkstedet barnehage Avd Ravneheia	Hjellemarka Fus barnehage AS	Espira Eventyrskogen Barnehage	Norlandia Solstua barnehage
Læringsverkstedet barnehage Avd Bispegra	Storebø Fus barnehage AS	Espira Evje barnehage	Norlandia Polarmåsen barnehage
Læringsverkstedet barnehage Avd Furukollen	Dalen Fus barnehage AS	Espira Evje barnehage	Norlandia Ulven Naturbarnehage

Læringsverkstedet barnehage Avd Handeland friluftsbarnehage	Birkenes Fus barnehage AS Avd Herefoss	Espira Evje barnehage	Norlandia Paradiset barnehage
Læringsverkstedet barnehage Avd Knertitten	Skolsegglia Fus barnehage AS	Espira Fasanveien	Norlandia Stordalen friluftsbarnehage
Læringsverkstedet barnehage Avd Knapstad barnehage	Sundve Fus barnehage AS	Espira Fenstad barnehage	Norlandia Eventyrstua barnehage
Læringsverkstedet barnehage Avd Verkensveien	Kongsberg International Preschool Fus AS	Espira Finnås Barnehage	Norlandia Nordbyhagen barnehage
Læringsverkstedet barnehage Avd Øyane barnehage	Håbet Fus barnehage	Espira Fjeldebakkane AS	Norlandia Gaustadskogen barnehage
Læringsverkstedet barnehage Avd Solkollen Bøle	Myrsnipa Fus barnehage AS	Espira Fjellsenden AS	Norlandia Solbergelva sprelloppbarnehage
Læringsverkstedet barnehage Avd Sandvoll barnehage	Nærsnes Fus barnehage Sa	Espira Garhaug barnehage	Norlandia Solbergmoen sprelloppbarnehage
Læringsverkstedet barnehage Avd Skomakergada	Søre Fusa barnehage	Espira Gartnerløkka Barnehage	Norlandia Glassverket barnehage
Læringsverkstedet barnehage Avd Grim	Barnehagenvår Sofus	Espira Gjemble barnehage	Norlandia Mogreina barnehage

Læringsverkstedet barnehage Avd Søndagsbakken barnehage	Riskatun Fus barnehage AS	Espira Grefsen Stasjon Barnehage	Norlandia Bekkevollen sprelloppbarnehage
Læringsverkstedet barnehage Avd Blomsterdalen	Steinhaugane Fus barnehage	Espira Grønnestølen Barnehage	Norlandia Huskestua barnehage
Læringsverkstedet barnehage Avd Erkleiv barnehage	Helleland Fus barnehage	Espira Gullhella barnehage	Norlandia Voksenkollen fritidsbarnehage
Læringsverkstedet barnehage Avd Sande	Haugesund International Preschool Fus AS	Espira Gåserud barnehage	Norlandia Kjeldmyrlia naturbarnehage
Læringsverkstedet barnehage Avd Kopervik	Vøyen Fus barnehage AS	Espira Halsnøy Kloster barnehage	Norlandia Kvitungen barnehage
Læringsverkstedet barnehage Avd Ervika	Lindtjønn Fus barnehage AS Avd Rødhettes Vei	Espira Helldalsåsen barnehage	Norlandia Polarreven Friluftsbanehage
Læringsverkstedet barnehage Avd Fjellhulen barnehage	Bollerød Fus barnehage	Espira Holbekk idrettsbarnehage AS	Norlandia Sørumsand barnehage
Læringsverkstedet barnehage Avd Nerenga	Fagstadlia Fus barnehage Avd Kringsjåvegen	Espira Hollund Barnehage	Norlandia Dalsliene barnehage

Læringsverkstedet barnehage Avd Portveien His	Djupmyra barnehage AS	Fus	Espira Holum Barnehage	Norlandia Arken barnehage AS
Læringsverkstedet barnehage Avd Løvåsen	Alvehetta barnehage	Fus	Espira Hovsmarka Barnehage	Norlandia Sørhellinga barnehage
Læringsverkstedet barnehage Sauarhagene avd Hjuksebø	Havhesten barnehage AS	Fus	Espira Husebyparken Barnehage	Norlandia Mellommyra barnehage
Læringsverkstedet barnehage Avd Olaløkka	Åsheimskog barnehage	Fus	Espira Høytorp Fort barnehage	Norlandia Eltonåsen friluftsbarnehage
Læringsverkstedet barnehage Avd Eplehagen barnehage	Fladaberg barnehage AS	Fus	Espira Juberg Gårdsbarnehage	Norlandia Sten-Tærud barnehage
Læringsverkstedet barnehage Avd Solkollen Askim	Møglestu barnehage AS	Fus	Espira Karmsund Barnehage	Norlandia Neskollen Melkeveien barnehage
Læringsverkstedet barnehage Avd Hasla	Håkonshella barnehage	Fus	Espira Kløverenga barnehage	Norlandia Marsvegen barnehage
Læringsverkstedet barnehage Avd Flatøy	Fjordadalen barnehage AS	Fus	Espira Knerten barnehage	Norlandia Fagerholt barnehage
Læringsverkstedet barnehage Avd Ullerøy	Snarveien barnehage	Fus	Espira Kniveåsen barnehage	Norlandia Kløvermarka barnehage

Læringsverkstedet barnehage Avd Haugenes	Nordbygdo Fus barnehage AS Avd Tyse	Espira Krystallveien barnehage	Norlandia Skistua barnehage
Læringsverkstedet barnehage Avd Knerten	Vassbrekke Fus Kulturbarnehage AS	Espira Kulturstien AS	Norlandia Naustvika barnehage
Læringsverkstedet barnehage Avd Helgerød barnehage	Hestnes Fus barnehage AS	Espira Kunnskapsby en Barnehage	Norlandia Sjøstjerna barnehage
Læringsverkstedet barnehage Avd Tveit	Fagstadlia Fus barnehage Avd Sigrid Undsets Veg	Espira Kuventræ barnehage	Norlandia Nilsemarka barnehage
Læringsverkstedet barnehage Avd Heimly	Skjoldastraumen Maritime Fus barnehage AS	Espira Kystad Gård barnehage	Norlandia Sjøflyhavna AS Avd barnehage
Læringsverkstedet barnehage Avd Grandehagen barnehage	Heia Fus barnehage AS Avd Sylling	Espira Lindesnes AS	Norlandia Tjuvholmen barnehage
Læringsverkstedet barnehage Avd Haugeråsen	Østre Strøm Fus barnehage	Espira Litlasund barnehage	Norlandia Vardefjellet kulturbarnehage
Læringsverkstedet barnehage Avd Slattum	Vestliskaret Fus barnehage AS	Espira Lura Barnehage	Norlandia Onkel Tomms Hytte Friluftsog idrettsbarnehage AS
Læringsverkstedet barnehage Avd Nordre Øyen barnehage	Tanum Fus barnehage AS	Espira Løvestad barnehage	Norlandia Kanonen barnehage

Læringsverkstedet barnehage Avd Fidje barnehage	Leiknes Fus barnehage AS	Espira Marienfryd Barnehage	Norlandia Borgeenga barnehage
Læringsverkstedet barnehage Avd Kvernabekken	Husøy Maritime Fus barnehage AS	Espira Marthahaugen barnehage	Norlandia Hvalrossen barnehage
Læringsverkstedet barnehage Avd Bekkeberget	Asparmarka Fus barnehage	Espira Moster Barnehage	Norlandia Enga barnehage
Læringsverkstedet barnehage Avd Ekornrud	Maudland Fus barnehage AS Avd Maudlandsveien	Espira Muruvik barnehage	Norlandia Myrertoppen barnehage
Læringsverkstedet barnehage Avd Napperød Naturbarnehage	Fernanda Fus barnehage AS Avd Lillohøyden	Espira Myraskogen barnehage	Norlandia Akrobaten Idrettsbarnehage
Læringsverkstedet barnehage Avd Kanebo	Øverkvern Fus barnehage	Espira Nordmo barnehage	Norlandia Furulund barnehage
Læringsverkstedet barnehage Avd Maura	Horneberg Fus barnehage AS	Espira Nybyen Barnehage	Norlandia Vollen naturbarnehage
Læringsverkstedet barnehage Avd Skytta	Lena Fus barnehage AS	Espira Nykirke AS	Norlandia Bjørnhaugen barnehage
Læringsverkstedet barnehage Avd Margaretalia	Hovsveien Fus barnehage AS	Espira Nykirke Barnehage	Norlandia Lysejordet barnehage

Læringsverkstedet barnehage Longum Naturbarnehage	Hallsetreina Fus barnehage	Espira Opaker barnehage	Norlandia Voksentoppen Ski og friluftsbarnehage
Læringsverkstedet barnehage Avd Åmot	Sjøskogbekken Fus barnehage AS	Espira Opsahl barnehage	Norlandia Solenga naturbarnehage
Læringsverkstedet Du og Jeg Sør	Eitillstad Fus-Barnehage	Espira Oreid Barnehage	
Læringsverkstedet barnehage Avd Geitspranget Naturbarnehage	Bakkefaret Fus barnehage	Espira Ormadalen barnehage	
Læringsverkstedet barnehage Avd Blindheim barnehage	Baglerbyen Fus barnehage AS	Espira Rambjøra barnehage	
Læringsverkstedet barnehage Avd Forus	Prestmosen Fus barnehage	Espira Ree barnehage	
Læringsverkstedet barnehage Avd Atlantis	Holmsåsen Fus barnehage AS	Espira Romholt barnehage	
Læringsverkstedet barnehage Avd Våganeset barnehage	Vågsbygd Fus barnehage AS	Espira Rubbestadnes et barnehage	
Læringsverkstedet barnehage Avd Flekkerøya barnehage	Presthaug Fus barnehage	Espira Rå barnehage	

Læringsverkstedet barnehage Avd Hompetitten	Bisjord barnehage AS	Fus	Espira Salamonskogen barnehage
Læringsverkstedet barnehage Avd Gustavas Hage barnehage	Almemoen barnehage	Fus	Espira Sandtoppen naturbarnehage AS
Læringsverkstedet barnehage Avd Sjiraffen barnehage	Strandkanten barnehage AS	Fus	Espira Sangereidåsen Barnehage
Læringsverkstedet barnehage Avd Ekrene Natur og Gårdsbarnehage	Hernes barnehage AS	Fus	Espira Scala Hundvåg barnehage
Læringsverkstedet barnehage Avd Kuholmen	Skorvane barnehage AS	Fus	Espira Scala Tasta barnehage
Læringsverkstedet barnehage Avd Gimlekollen	Hornienga barnehage AS	Fus	Espira Skjeaberget barnehage
Læringsverkstedet barnehage Avd Opphaug Natur og Gårdsbarnehage	Kråka Kulturbarnehage AS	Fus	Espira Skolegata barnehage
Læringsverkstedet barnehage Avd Maskinisten friluftsbarnehage	Polaris barnehage AS	Fus	Espira Skåredalen barnehage

Læringsverkstedet barnehage Avd Lødingen	Sauafjellet barnehage AS	Fus	Espira Sletten Barnehage
Læringsverkstedet barnehage Avd Liantjønn barnehage	Lunderåsen barnehage	Fus	Espira Snurrefjellet barnehage
Læringsverkstedet barnehage Avd Gardstunet barnehage	Valvatna barnehage	Fus	Espira Solknatten barnehage
Læringsverkstedet Sætra idrettsbarnehage	Jar Fus barnehage		Espira Solkroken barnehage
Læringsverkstedet barnehage Avd Vårres	Rotnes barnehage	Fus	Espira Spirea Barnehage
Læringsverkstedet barnehage Avd Hinkenhopp	Follebu barnehage	Fus	Espira Steinsviken Barnehage
Læringsverkstedet barnehage Avd Randineborg	Ikornnes barnehage AS	Fus	Espira Stjørdal AS
Læringsverkstedet barnehage Avd Vatnekrossen barnehage	Lundehagen barnehage	Fus	Espira Stongafjellet barnehage
Læringsverkstedet barnehage Avd Solkollen Hånes	Sinsen barnehage AS	Fus	Espira Sundbyfoss barnehage

Læringsverkstedet barnehage Avd Nerby	Hølen barnehage AS	Fus	Espira Sånum Barnehage
Læringsverkstedet barnehage Avd Granåslia barnehage	Åsebøen barnehage AS	Fus	Espira Taremareby barnehage
Læringsverkstedet barnehage Avd Åsane Gårds og Friluftsbhg	Gjermundshaugen Fus barnehage AS		Espira Tastarustå AS
Læringsverkstedet barnehage Avd Fana Gårds og Friluftsbhg	Grilstad barnehage AS	Fus	Espira Tau Barnehage
Læringsverkstedet barnehage Avd Maurtua barnehage	Asperud barnehage AS	Fus	Espira Tjøsvoll barnehage
Læringsverkstedet barnehage Avd Slangsvold barnehage	Tomter barnehage AS	Fus	Espira Torsbergskog en barnehage
Læringsverkstedet barnehage Avd Borgen	Skåre barnehage AS	Fus	Espira Torshovdalen Barnehage
Læringsverkstedet barnehage Avd Sæ barnehage	Bybrua barnehage AS	Fus	Espira Tristilbakken Barnehage
Læringsverkstedet barnehage Avd Solkollen barnehage Søm	Lindeberg barnehage	Fus	Espira Trygstad Barnehage

Læringsverkstedet barnehage Avd Store Tune Gård barnehage	Industriveien barnehage	Fus	Espira Ulsetskogen barnehage
Læringsverkstedet Strutsen Naturbarnehage	Sjøhagen barnehage AS	Fus	Espira Ulvenvatnet Barnehage
Læringsverkstedet barnehage Avd Limi Naturbarnehage	Tindfoten barnehage AS	Fus	Espira Vagletjørn barnehage
Læringsverkstedet barnehage Avd Blåtoppen	Brånåstoppen barnehage	Fus	Espira Vannverksdammen barnehage
Læringsverkstedet barnehage Avd Marthas Hage barnehage	Bergskaug barnehage AS	Fus	Espira Vanse barnehage
Læringsverkstedet barnehage Avd Steinsvikkroken	Veslefrikk barnehage AS	Fus	Espira Varbak barnehage
Læringsverkstedet barnehage Avd Draget	Løvehjerte barnehage AS	Fus	Espira Vedderheia Barnehage
Læringsverkstedet Sørengkaia AS	Rosendal barnehage AS	Fus	Espira Veldetun barnehage

Læringsverkstedet barnehage Avd Årvollveien	Nordbygdo barnehage AS Avd Prestagardskogen	Fus Espira Østrem barnehage
Læringsverkstedet barnehage Avd Kløvningsten	Skyset barnehage AS	Fus Espira Åbol barnehage
Læringsverkstedet barnehage Avd Skogmo	Borgen barnehage	Fus Espira Århaug barnehage
Læringsverkstedet barnehage Avd Solhellinga	Snippen barnehage	Fus Espira Årosfjellet Barnehage
Læringsverkstedet barnehage Slaabervig Naturbarnehage	Lillehagen barnehage AS	Fus Espira Årølia Barnehage
Læringsverkstedet barnehage Avd Bodøsjøen	Gubbeskogen barnehage	Fus Holmenveien barnehage Espira
Læringsverkstedet barnehage Avd Hauketo	Smidsrød barnehage AS	Fus
Læringsverkstedet barnehage Avd Bryn barnehage	Kjemperud barnehage AS	Fus
Læringsverkstedet barnehage Avd Grefsen Terrasse naturbarnehage	Kleppestemmen Fus barnehage	

Læringsverkstedet barnehage Avd Notveien Naturbarnehage	Senterbarnehagen Fus AS	
Læringsverkstedet barnehage Avd Langaard barnehage	Sjølyst barnehage AS	Fus
Læringsverkstedet barnehage Avd Skogly	Bruhammaren barnehage	Fus
Læringsverkstedet barnehage Avd Trollmyra Naturbarnehage	Harakollen Aktivitetsbarnehage AS	Fus
Læringsverkstedet barnehage Avd Presteheia barnehage	Iglemyr barnehage	Fus
Læringsverkstedet Du og Jeg Nord	Ølensjøen barnehage AS	Fus
Læringsverkstedet barnehage Avd Aronien	Lindtjønn barnehage Avd Louises Vei	Fus
Læringsverkstedet barnehage Avd Støtvigenga	Vassenga barnehage AS	Fus
Læringsverkstedet barnehage Avd Bamsebo	Fager Skog barnehage	Fus

Læringsverkstedet barnehage Avd Doremi Halden	Tjøttaparken barnehage AS	Fus
Læringsverkstedet barnehage Avd Rom barnehage	Hasselbakken barnehage AS	Fus
Læringsverkstedet barnehage Avd Rørensletta	Hammermo barnehage AS	Fus
Læringsverkstedet barnehage Avd Heimdalenga	Heddeveien barnehage AS	Fus
Læringsverkstedet barnehage Avd Vestadbakken	Tveterjordet barnehage AS	Fus
Læringsverkstedet barnehage Sauarhagene avd Nordagutu	Alsgård barnehage	Fus
Læringsverkstedet barnehage Avd Øvre Neskollen	Breenenga barnehage	Fus
Læringsverkstedet barnehage Avd Bråvannsåsen barnehage	Sviland barnehage AS	Fus
Læringsverkstedet barnehage Avd Saltvern	Beisfjord barnehage AS	Fus

Læringsverkstedet barnehage Avd Faråna	Storafjellet barnehage	Fus
Læringsverkstedet barnehage Avd Tornerose barnehage	Sævarhagen barnehage AS	Fus
Læringsverkstedet barnehage Avd Lersbrygga	Rossabø Aktivitetsbarnehage AS	Fus
Læringsverkstedet barnehage Avd Haugenstykket	Bratsberg Kulturbarnehage AS	Fus
Læringsverkstedet barnehage Avd Klyveskogen barnehage	Mosjøen barnehage AS	Fus
Læringsverkstedet barnehage Avd Fagertun barnehage	Bakarvågen barnehage AS	Fus
Læringsverkstedet barnehage Avd Lindebøskauen	Sørstrand Maritime Fus barnehage AS	
Læringsverkstedet barnehage Avd Eidet barnehage	Grønnmyra barnehage	Fus
Læringsverkstedet barnehage Avd Helgatun	Solåsen barnehage AS	Fus

Læringsverkstedet AS Avd Mariknotten barnehage	Eivindsholen barnehage AS	Fus
Læringsverkstedet barnehage Avd Kleppe barnehage	Nymarkbakken barnehage AS	Fus
Læringsverkstedet barnehage Avd Doremi Elstangen	Puttara barnehage AS	Fus
Læringsverkstedet Tiriltoppen	Drafnkollen barnehage AS	Fus
Læringsverkstedet barnehage Avd Glendrange barnehage	Bærumsmarka barnehage AS	Fus
Læringsverkstedet barnehage Avd Solkollen barnehage Hellemyr	Knærten Friluftsbarnehage AS	Fus
Læringsverkstedet barnehage Risenga barnehage	Kiellandskogen barnehage	Fus
Læringsverksteder Runni idrettsbarnehage	Jærbarnehagen	Fus
Læringsverkstedet barnehage Våler naturbarnehage	Brødholt barnehage AS	Fus

Læringsverkstedet barnehage Avd Valen	Sagvåg Maritime Fus barnehage AS	
Læringsverkstedet barnehage Avd Krokusbakken	Øyno barnehage	Fus
Læringsverkstedet barnehage Avd Doremi Begby	Helledammen barnehage AS	Fus
Læringsverkstedet Risteigen barnehage	Steinarskogen barnehage AS	Fus
Læringsverkstedet barnehage Avd Skoger	Olderdalen barnehage	Fus
Læringsverkstedet barnehage Avd Jåsund	Birkenes barnehage AS Avd Birkeland	Fus
Læringsverkstedet barnehage Avd Trålveien	Bekkjarvik Maritime barnehage	Fus
Læringsverkstedet barnehage Avd Søgne	Bakkedalen barnehage	Fus
Læringsverkstedet barnehage Avd Straume	Qmarkå barnehage AS	Fus
Læringsverkstedet barnehage Avd Olsvika	Sjøliv barnehage AS	Fus
Læringsverkstedet barnehage Avd Kanutten	Udland barnehage AS	Fus

Læringsverkstedet barnehage Avd Lillås	Stokke Maritime Fus barnehage AS	
Læringsverkstedet barnehage Avd Knøttene	Rishagen barnehage AS	Fus
Læringsverkstedet barnehage Avd Medås Gårdsbarnehage	Brødfabrikken barnehage AS	Fus
Læringsverkstedet barnehage Avd Sarpsborg Doremi	Lillohagen barnehage AS	Fus
Læringsverkstedet barnehage Avd Dalgårdtunet barnehage	Grefsenlyst barnehage AS	Fus
Læringsverkstedet barnehage Avd Skogheim	Ringnes Park barnehage AS	Fus
Læringsverkstedet barnehage Avd Trollberget barnehage	Ringstabekk barnehage AS	Fus
Læringsverkstedet barnehage Avd Kuvågen	Vippa barnehage AS	Fus
Læringsverkstedet barnehage Avd Bratteborg barnehage	Furuberget Aktivitetsbarnehage AS	Fus
Læringsverkstedet barnehage Avd Du og Jeg Juvik	Salbutangen barnehage AS	Fus

Læringsverkstedet barnehage Avd Sørlandsparken barnehage	Fernanda barnehage AS Avd Elvelunden	Fus
Læringsverkstedet barnehage Avd Kongerød barnehage	Kulturparken barnehage AS	Fus
Læringsverkstedet barnehage Avd Julebygda	Kruttverket barnehage AS	Fus
Læringsverkstedet barnehage Avd Solkollen Lyngmo barnehage	Stemvegen barnehage	Fus
Læringsverkstedet barnehage Avd Bygdestua	Nordpolen barnehage AS Avd Idun	Fus
Læringsverkstedet barnehage Avd Åse barnehage	Nordpolen barnehage AS Avd Sandakerveien	Fus
Læringsverkstedet barnehage Avd Tønsåsen Naturbarnehage	Engesvea barnehage AS	Fus
Læringsverkstedet barnehage Avd Dal	Smedbakken barnehage AS	Fus
Læringsverkstedet barnehage Avd Knerten Føynland barnehage	Diseth barnehage AS	Fus

Læringsverkstedet barnehage Harmonien Doremi barnehage	Mellom- Nes barnehage AS	Fus
Læringsverkstedet barnehage Avd Helsviga Naturbarnehage	Stjernen barnehage AS	Fus
Læringsverkstedet barnehage Avd Hannes Lekestue Tjensvoll	Nedre Høvik barnehage	Fus
Læringsverkstedet barnehage Avd Hannes Lekestue Madla	Skytterbanen barnehage AS	Fus
Læringsverkstedet barnehage Avd Idrettsbarnehage Østersund	Morbergtoppen barnehage AS	Fus
Læringsverkstedet barnehage Avd Mattisgården	Heia Fus barnehage AS Avd Lierskogen	
Læringsverkstedet barnehage Avd Gystadmarka	Lykketrollet barnehage AS	Fus
Læringsverkstedet barnehage Avd Myråsen barnehage	Tørkopp barnehage	Fus

Læringsverkstedet barnehage Avd Folkeparken Dal	Kværnerbyen barnehage AS	Fus
Læringsverkstedet barnehage Avd Lysaker idrettsbarnehage	Hektneråsen barnehage AS	Fus
Læringsverkstedet barnehage Avd Fjeldebakkane	Sandven barnehage AS	Fus
Læringsverkstedet barnehage Avd Brekkåsen Idrettsbarnehage	Eventyrlia barnehage	Fus
Læringsverkstedet barnehage Avd Jar Idrettsbarnehage		
Læringsverkstedet barnehage Avd Kristiansund Idrettsbarnehage		
Læringsverkstedet barnehage Avd Doremi Trosvik		
Læringsverkstedet barnehage Avd Råholt		

Læringsverkstedet barnehage Avd Midtunbråtet barnehage
Læringsverkstedet barnehage Avd Søreidtunet barnehage
Læringsverkstedet barnehage Avd Hammersborg barnehage
Læringsverkstedet barnehage Avd Buenget
Læringsverkstedet barnehage Avd Humlehaugen
Læringsverkstedet barnehage Avd Tyholmen barnehage
Læringsverkstedet barnehage Avd Gvarv barnehage
Læringsverkstedet barnehage Avd Fornebu Idrettsbarnehage
Læringsverkstedet barnehage Avd Konfektfabrikken

Læringsverkstedet barnehage Avd Bjerke Panorama
Læringsverkstedet barnehage Avd Haugerudhagan
Læringsverkstedet barnehage Avd Haslum Idrettsbarnehage
Læringsverkstedet barnehage Avd Tvildemoen
Læringsverkstedet barnehage Avd Waldemars
Læringsverkstedet barnehage Avd Billingstad
Læringsverkstedet barnehage Avd Blåbærstien barnehage
Læringsverkstedet barnehage Avd Hurdal
Læringsverkstedet barnehage Avd Vestskrenten Idrettsbarnehage

Læringsverkstedet barnehage Avd Lervig Brygge barnehage
Læringsverkstedet barnehage Avd Mortensrud
Læringsverkstedet barnehage Avd Halmstad
Læringsverkstedet Torshovhagen
Læringsverkstedet barnehage Avd Nordbymoen
Læringsverkstedet barnehage Avd Eydehavn Naturbarnehage
Læringsverkstedet barnehage Avd Bjørndalen
Læringsverkstedet barnehage Veraåsen barnehage
Læringsverkstedet barnehage Avd Myrvoll idrettsbarnehage

Læringsverkstedet
barnehage Avd Soltun

Læringsverkstedet
barnehage Avd Bjørnsrud
Skog

Læringsverkstedet
barnehage Avd Mork

Appendix C - Private Equity Owned Kindergartens

Group	Espira/AcadeMedia	Gnist
Owner	EQT VI	Altor IV
Entry	June 2010	May 2018
Exit	October 2017	September 2021
	Espira Aarkjær Barnehage	Gnist Barnehager Myklebust AS
	Espira Arcen barnehage	Gnist Barnehager Sætra AS
	Espira Baggerødbanen Barnehage	Gnist Barnehager Flisnes AS
	Espira Bjørgene barnehage	Gnist Barnehager Bjørkavåg AS
	Espira Blakstad barnehage	Gnist Barnehager Festeråsen AS
	Espira Brådalsfjellet barnehage	Gnist barnehager Høgvoll AS
	Espira Bråsteintunet Barnehage	Gnist Barnehager Husbyåsen AS
	Espira Bråsteintunet Barnehage	Gnist Barnehager Ratvika
	Espira Dragerskogen barnehage	Gnist Barnehager Hessa AS
	Espira Dvergsnes barnehage	Gnist Barnehager Holstad AS
	Espira Eikenga barnehage	Gnist Barnehager Rollandslia AS
	Espira Eikenøtta naturbarnehage AS	Gnist Barnehager Brennan AS
	Espira Evangtunet Barnehage	Gnist Barnehager Støylane AS
	Espira Eventyrskogen Barnehage	Gnist Barnehager Trøa AS
	Espira Evje barnehage	Gnist Barnehager Skogstunet AS

Espira Evje barnehage	Gnist Barnehager Tiller AS
Espira Evje barnehage	Gnist Barnehager Nordstrand AS
Espira Fasanveien	
Espira Fenstad barnehage	
Espira Finnås Barnehage	
Espira Fjeldebakkane AS	
Espira Fjellsenden AS	
Espira Garhaug barnehage	
Espira Gartnerløkka Barnehage	
Espira Gjemble barnehage	
Espira Grefsen Stasjon Barnehage	
Espira Grønnestølen Barnehage	
Espira Gullhella barnehage	
Espira Gåserud barnehage	
Espira Halsnøy Kloster barnehage	
Espira Helldalsåsen barnehage	
Espira Holbekk idrettsbarnehage AS	
Espira Hollund Barnehage	
Espira Holum Barnehage	
Espira Hovsmarka Barnehage	

Espira Husebyparken Barnehage

Espira Høytorp Fort barnehage

Espira Juberg Gårdsbarnehage

Espira Karmsund Barnehage

Espira Kløverenga barnehage

Espira Knerten barnehage

Espira Kniveåsen barnehage

Espira Krystallveien barnehage

Espira Kulturstien AS

Espira Kunnskapsbyen Barnehage

Espira Kuventræ barnehage

Espira Kystad Gård barnehage

Espira Lindesnes AS

Espira Litlasund barnehage

Espira Lura Barnehage

Espira Løvestad barnehage

Espira Marienfryd Barnehage

Espira Marthahaugen barnehage

Espira Moster Barnehage

Espira Muruvik barnehage

Espira Myraskogen barnehage

Espira Nordmo barnehage

Espira Nybyen Barnehage

Espira Nykirke AS

Espira Nykirke Barnehage

Espira Opaker barnehage

Espira Opsahl barnehage

Espira Oreid Barnehage

Espira Ormadalen barnehage

Espira Rambjøra barnehage

Espira Ree barnehage

Espira Romholt barnehage

Espira Rubbestadneset barnehage

Espira Rå barnehage

Espira Salamonskogen barnehage

Espira Sandtoppen naturbarnehage AS

Espira Sangereidåsen Barnehage

Espira Scala Hundvåg barnehage

Espira Scala Tasta barnehage

Espira Skjeaberget barnehage

Espira Skolegata barnehage

Espira Skåredalen barnehage

Espira Sletten Barnehage

Espira Snurrefjellet barnehage

Espira Solknatten barnehage

Espira Solkroken barnehage

Espira Spirea Barnehage

Espira Steinsviken Barnehage

Espira Stjørdal AS

Espira Stongafjellet barnehage

Espira Sundbyfoss barnehage

Espira Sånum Barnehage

Espira Taremareby barnehage

Espira Tastarustå AS

Espira Tau Barnehage

Espira Tjøsvoll barnehage

Espira Torsbergskogen barnehage

Espira Torshovdalen Barnehage

Espira Tristilbakken Barnehage

Espira Trygstad Barnehage

Espira Ulsetskogen barnehage

Espira Ulvenvatnet Barnehage

Espira Vagletjørn barnehage

Espira Vannverksdammen barnehage

Espira Vanse barnehage

Espira Varbak barnehage

Espira Vedderheia Barnehage

Espira Veldetun barnehage

Espira Østrem barnehage

Espira Åbol barnehage

Espira Århaug barnehage

Espira Årosfjellet Barnehage

Espira Årølia Barnehage

Holmenveien barnehage Espira

Appendix D – Descriptive Statistics of Socioeconomic Indicators

Socioeconomic Indicators

Statistic	N	Mean	St. Dev.	Min	Max
Unemployment	20,440	2.309	0.827	0.000	11.200
Average Square Meter Price	20,393	28,444.300	19,005.580	0.000	126,708.900
Average Value	20,194	2,958,145.000	1,702,824.000	40,000.000	27,050,000.000
Number of Records	12,408	28.451	31.783	0	289

This table presents the summary statistics of the socioeconomic indicators used in the analysis. The data is descriptive for all postcodes and counties in the period 2016-2019, with the unit of observation being the facility being postcode and year. In ascending order the columns represent number of observations, mean, standard deviation, lowest observed and highest observed value.

Appendix E – Norway's Largets Cities

Table is an extract from SSB's Table 05277 and based on the year 2019 and shows the 10 urban areas with the highest population.

Urban Area	**Population**	**Size of Urban Area (km^2)**	**Density**
Oslo	1019513	270.68	3766.488
Bergen	257087	87.34	2943.52
Stavanger/Sandnes	225020	79.31	2837.221
Trondheim	186364	58.21	3201.58
Fredrikstad/Sarpsborg	113622	58.08	1956.302
Drammen	107930	46.94	2299.318
Porsgrunn/Skien	93255	53.12	1755.553

Kristiansand	64057	24.89	2573.604
Ålesund	53234	28.36	1877.08
Tønsberg	52419	26.46	1981.066

Appendix F – Definition of the Variable Names Used

0 year old	The number or children aged 0. It is the child's year of birth that determines the age, not when in the year the child was born.
1 year old	The number or children aged 1. It is the child's year of birth that determines the age, not when in the year the child was born. One-year-olds can be children with or without the right to a nursery place. For 2017, all children who turn 1 by 30 November are entitled to a nursery place. Until 2015, the right to a kindergarten place applied to all 1-year-olds who were born before 31 August. For 2016, the right was extended to apply to 1-year-olds born before 31 October. In 2017, the right was extended to apply to 1-year-olds born before 30 November.
2 years old	The number or children aged 2. It is the child's year of birth that determines the age, not when in the year the child was born.
3 years old	The number or children aged 3. It is the child's year of birth that determines the age, not when in the year the child was born.
4 years old	The number or children aged 4. It is the child's year of birth that determines the age, not when in the year the child was born.
5 years old	The number or children aged 5. It is the child's year of birth that determines the age, not when in the year the child was born. Children aged older than 5 who have a delayed school start are present in this category for privacy reasons.
Adaptation and school start	Gives the average score of the adaptation and school start questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio

	between the number of invited parents and the number of completed forms.
Average m^2 Price	The average square meter price in a given post code area
Average Value	The average property value in a given postcode area
Big Kindergarten	Facility with more than 80 children
Big4	A facility identified as part of the four largest groups PE owned for that time period and present in Appendix B
Boarding fee	The monthly amount parents pay for meals per child with a full place in the kindergarten. Boarding fees are in addition to the maximum price and must only cover actual expenses for meals in the nursery. The rules on payment of childrens' boarding fees are laid down in regulations on parental payment in kindergartens.
Child Care and Youth Worker	Employees with a certificate in child and youth workers. Represents the share of the facility's staff that meet this category.
Child per employee	The table shows the number of children per man-year for the basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children. The job categories pedagogical leader and other basic staff makes up the basic staff. Children are weighted based on age and length of stay. Children under the age of three are counted double in this calculation. This means that the number given here is the number of children per employee as if all the children were older than three. This means that the figure is comparable for facilities with different age demographics. Children are considered to be over the age of three from August of the year in which they turn three. Consideration has also been given to the children's agreed length of stay in the nursery.

Child per kindergarten teacher	The table shows the number of children per man-year for kindergarten teachers in the basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children, and consist of the job categories pedagogical leaderand other basic staff. Children are weighted based on age. Children under the age of three count double in this calculation. This means that the number given here is the number of children per employee as if all the children were adults. Children are considered to be over the age of three from August of the year in which they turn three. This means that the figure is comparable for kindergartens with different age groups. Children's length of stay is not taken into account in the calculation of children per kindergarten teacher. Man-years are counted as kindergarten teachers or equivalent for the positions of pedagogical leaders manager and other basic staff.
Dispensation from educational requirements for pedagogical leaders	Exemption from educational requirements shows the number of kindergartens with a permanent or temporary exemption from the education requirement for educational leaders, cf. §3 of the Regulations on pedagogical staffing and exemptions in kindergartens.
Dispensation from staffing norm	Shows the number of nurseries that state that they have been granted a dispensation from the staffing norm cf. the Kindergartens Act § 26.
Does not fulfil the pedagogical norm	The nursery school does not meet the pedagogic norm and has not applied for or received a dispensation from the education requirement for pedagogical leaders
Equivalent to kindergarten teacher	Employees with another 3-year pedagogical education and additional education in kindergarten pedagogy (60 credits). Other pedagogical education can be general teacher, subject teacher, special education

	teacher or child protection teacher. Represents the share of the facility's staff that meet this category.
FTE basic staff in total	The number of man-years spent on staff working directly with children
FTE Directors	The number of man-years spent on director postion. Directorshave day-to-day responsibility in the kindergarten. It is required by law for all kindergartens to have a day-to-day manager who has education as a kindergarten teacher or other university education that provides childcare and pedagogical competence. There is more about the director's duties in the framework plan.
FTE other basic staff	The number of man-years spent on other basic staff. This includes all other staff, which work directly with the children.
FTE Pedagogical leaders	The number of man-years spent on pedagogical leaders postion. The pedgaogical leader is responsible for implementing and leading the educational work. The pedagogical leader must have education as a kindergarten teacher or other three-year pedagogical education at university level with further education in kindergarten pedagogy.
Fulfils the pedagogical norm	The nursery school has sufficient man-years for educational leaders to meet the pedagogic standard
Fulfils the pedagogical norm with dispensation	The kindergarten has sufficient man-years for educational leaders when one includes pedagogical leaders with a dispensation from the education requirement.
Have been supervised	The municipality, as a kindergarten authority, supervises both municipal and private kindergartens cf. Regulation on transitional rules to the Kindergartens Act § 2. There may have been either written supervision, local supervision or both. No information is collected on what areas the inspection was carried out in or what the result of the inspection was. The fact that the nursery has been supervised means

	that there is a supervision report that is available in the municipality. Whether or not a nursery has been supervised does not say anything about the quality of the nursery.
Independent	A private facility that is neither PE-owned or part of the largest groups
Information	Gives the average score of the information questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Kindergarten teacher	The category kindergarten teacher is used for kindergarten teacher training or preschool teacher training. Kindergarten teacher training does not include employees with other educational training that corresponds to the educational requirements for leader or pedagogical leaders. Represents the share of the facility's staff that meet this category.
Living area per child, sqm	Shows the approved indoor play and living area (m2) in the kindergarten divided by the number of children. In this section, children are not weighted for age. According to the guideline standard, small children under the age of three should have an average of 5.3 square meters of living space, while older children should have 4.0 square meters. The outdoor area should be six times as large as the indoor area. We do not have information about the kindergartens' outdoor area.
Male basic staff in total	Proportion of men who work in the job categories of educational leaders and other basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children and

	consist of the job categories pedagogical managers and other basic staff. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male directors	Proportion of men who work in the job category of managers. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male directors and basic staff in total	Proportion of men who work in the job categories of managers, educational leaders and other basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children and consist of the job categories pedagogical managers and other basic staff. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male other basic staff	Proportion of men who work in the job category of other basic staff. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male pedagogical leaders	Proportion of men who work in the job category of pedagogical leaders. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Number of answers per kindergarten	The total number of parents responding to the KPS. Only one respondent per child is possible. However families with more than one child are allowed one answer per child.
Number of children	The total number of children present in the kindergarten
Number of Transactions	The number of real-estate transactions recorded in a post code area. Only real-estate deemed to be housing is counted.

Opening hours per day	The average opening hours in the nursery show the number of hours the nursery is open per day. For nurseries that have varying opening hours per day or per week, the most common opening times are used. Information about when the kindergarten opens and closes is published in Barnehagefakta.
Other background	Includes employees with other educational backgrounds. There may be employees with primary school education or other education at upper secondary level. Represents the share of the facility's staff that meet this category.
Other higer educatiom	College and university education that is not included in the categories kindergarten teacher education or other educational education. Represents the share of the facility's staff that meet this category.
Other pedagogical education	Employees with 3-year pedagogical education at college or university level who do not have the additional education in kindergarten pedagogy that is required to be employed as an pedagocial leader. Represents the share of the facility's staff that meet this category.
Other skilled worker	Employees with a certificate or vocational qualification other than child and youth worker. Represents the share of the facility's staff that meet this category.
Outdoor and indoor environment	Gives the average score of the outdoor and indoor environment questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.

Parental payment below maximum	The maximum price applies to an all-day ordinary kindergarten offer. The municipality can offer a lower maximum price than the national price. Moderation arrangements and sibling moderation are not included in the statistics on the kindergarten's maximum price. The rules on parental payment are laid down in regulations on parental payment in kindergartens.
Participation	Gives the average score of the participationquestions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
PE	A facility identified as PE owned for that time period and present in Appendix C
Pickup and delivery	Gives the average score of the pickup and delivery questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Price in Lower Percentile	A postcode area with housing prices in the lower quartile of that county
Price in Upper Percentile	A postcode area with housing prices in the upper quartile of that county

Public	A facility that is owned by a municipality
Relationship between children and adults	Gives the average score of the relationship between children and adults questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Response rate	The number of respondents to the KPS divided by the number of invited
Satisfaction	Gives the average score of the overall satisfaction questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Small Kindergarten	Facility with less than 45 children
Square Meter Price in Lower Quartile	A postcode area with square meter housing prices in the lower quartile of that county
Square Meter Price in Upper Quartile	A postcode area with square meter housing prices in the upper quartile of that county

The child's development	Gives the average score of the child's development questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
The child's well being	Gives the average score of the The child's well being in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Unemployment	The level of unemployment in a given county. The definition of unemployed by Statistics Norway are people who are able to work, seeking income generating employment at the welfare office (NAV), are available to work and have not had generating income for the past two weeks
Kindergarten teacher	The category kindergarten teacher is used for kindergarten teacher training or preschool teacher training. Kindergarten teacher training does not include employees with other educational training that corresponds to the educational requirements for leader or pedagogical leaders. Represents the share of the facility's staff that meet this category.

Equivalent to kindergarten teacher	Employees with another 3-year pedagogical education and additional education in kindergarten pedagogy (60 credits). Other pedagogical education can be general teacher, subject teacher, special education teacher or child protection teacher. Represents the share of the facility's staff that meet this category.
Other pedagogical education	Employees with 3-year pedagogical education at college or university level who do not have the additional education in kindergarten pedagogy that is required to be employed as an pedagocial leader. Represents the share of the facility's staff that meet this category.
Child Care and Youth Worker	Employees with a certificate in child and youth workers. Represents the share of the facility's staff that meet this category.
Other higer educatiom	College and university education that is not included in the categories kindergarten teacher education or other educational education. Represents the share of the facility's staff that meet this category.
Other skilled worker	Employees with a certificate or vocational qualification other than child and youth worker. Represents the share of the facility's staff that meet this category.
Other background	Includes employees with other educational backgrounds. There may be employees with primary school education or other education at upper secondary level. Represents the share of the facility's staff that meet this category.
Number of children	The total number of children present in the kindergarten
0 years old	The number or children aged 0. It is the child's year of birth that determines the age, not when in the year the child was born.
1 year old	The number or children aged 1. It is the child's year of birth that determines the age, not when in the year the child was born. One-year-

	olds can be children with or without the right to a nursery place. For 2017, all children who turn 1 by 30 November are entitled to a nursery place. Until 2015, the right to a kindergarten place applied to all 1-year-olds who were born before 31 August. For 2016, the right was extended to apply to 1-year-olds born before 31 October. In 2017, the right was extended to apply to 1-year-olds born before 30 November.
2 years old	The number or children aged 2. It is the child's year of birth that determines the age, not when in the year the child was born.
3 years old	The number or children aged 3. It is the child's year of birth that determines the age, not when in the year the child was born.
4 years old	The number or children aged 4. It is the child's year of birth that determines the age, not when in the year the child was born.
5 years old	The number or children aged 5. It is the child's year of birth that determines the age, not when in the year the child was born. Children aged older than 5 who have a delayed school start are present in this category for privacy reasons.
Child per employee	The table shows the number of children per man-year for the basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children. The job categories pedagogical leader and other basic staff makes up the basic staff. Children are weighted based on age and length of stay. Children under the age of three are counted double in this calculation. This means that the number given here is the number of children per employee as if all the children were older than three. This means that the figure is comparable for facilities with different age demographics. Children are considered to be over the age of three from August of the year in which they turn three. Consideration has also been given to the children's agreed length of stay in the nursery.

Child per kindergarten teacher	The table shows the number of children per man-year for kindergarten teachers in the basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children, and consist of the job categories pedagogical leaderand other basic staff. Children are weighted based on age. Children under the age of three count double in this calculation. This means that the number given here is the number of children per employee as if all the children were adults. Children are considered to be over the age of three from August of the year in which they turn three. This means that the figure is comparable for kindergartens with different age groups. Children's length of stay is not taken into account in the calculation of children per kindergarten teacher. Man-years are counted as kindergarten teachers or equivalent for the positions of pedagogical leaders manager and other basic staff.
Dispensation from educational requirements for pedagogical leaders	Exemption from educational requirements shows the number of kindergartens with a permanent or temporary exemption from the education requirement for educational leaders, cf. §3 of the Regulations on pedagogical staffing and exemptions in kindergartens.
Dispensation from staffing norm	Shows the number of nurseries that state that they have been granted a dispensation from the staffing norm cf. the Kindergartens Act § 26.
Male directors	Proportion of men who work in the job category of managers. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male pedagogical leaders	Proportion of men who work in the job category of pedagogical leaders. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.

Male other basic staff	Proportion of men who work in the job category of other basic staff. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male basic staff in total	Proportion of men who work in the job categories of educational leaders and other basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children and consist of the job categories pedagogical managers and other basic staff. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Male directors and basic staff in total	Proportion of men who work in the job categories of managers, educational leaders and other basic staff. The basic staff are the employees in the kindergarten who work directly with the entire group of children and consist of the job categories pedagogical managers and other basic staff. The proportion of men is calculated by dividing the number of men by the total number of employees within each job category.
Living area per child, sqm	Shows the approved indoor play and living area (m2) in the kindergarten divided by the number of children. In this section, children are not weighted for age. According to the guideline standard, small children under the age of three should have an average of 5.3 square meters of living space, while older children should have 4.0 square meters. The outdoor area should be six times as large as the indoor area. We do not have information about the kindergartens' outdoor area.
Opening hours per day	The average opening hours in the nursery show the number of hours the nursery is open per day. For nurseries that have varying opening hours per day or per week, the most common opening times are used. Information about when the kindergarten opens and closes is published in Barnehagefakta.

Boarding fee	The monthly amount parents pay for meals per child with a full place in the kindergarten. Boarding fees are in addition to the maximum price and must only cover actual expenses for meals in the nursery. The rules on payment of childrens' boarding fees are laid down in regulations on parental payment in kindergartens.
Parental payment below maximum	The maximum price applies to an all-day ordinary kindergarten offer. The municipality can offer a lower maximum price than the national price. Moderation arrangements and sibling moderation are not included in the statistics on the kindergarten's maximum price. The rules on parental payment are laid down in regulations on parental payment in kindergartens.
Have been supervised	The municipality, as a kindergarten authority, supervises both municipal and private kindergartens cf. Regulation on transitional rules to the Kindergartens Act § 2. There may have been either written supervision, local supervision or both. No information is collected on what areas the inspection was carried out in or what the result of the inspection was. The fact that the nursery has been supervised means that there is a supervision report that is available in the municipality. Whether or not a nursery has been supervised does not say anything about the quality of the nursery.
Fulfils the pedagogical norm	The nursery school has sufficient man-years for educational leaders to meet the pedagogic standard
Does not fulfil the pedagogical norm	The nursery school does not meet the pedagogic norm and has not applied for or received a dispensation from the education requirement for pedagogical leaders
Fulfils the pedagogical norm with dispensation	The kindergarten has sufficient man-years for educational leaders when one includes pedagogical leaders with a dispensation from the education requirement.

FTE Directors	The number of man-years spent on director postion. Directorshave day-to-day responsibility in the kindergarten. It is required by law for all kindergartens to have a day-to-day manager who has education as a kindergarten teacher or other university education that provides childcare and pedagogical competence. There is more about the director's duties in the framework plan.
FTE Pedagogical leaders	The number of man-years spent on pedagogical leaders postion. The pedgaogical leader is responsible for implementing and leading the educational work. The pedagogical leader must have education as a kindergarten teacher or other three-year pedagogical education at university level with further education in kindergarten pedagogy.
FTE other basic staff	The number of man-years spent on other basic staff. This includes all other staff, which work directly with the children.
FTE basic staff in total	The number of man-years spent on staff working directly with children
Unemployment	The level of unemployment in a given county. The definition of unemployed by Statistics Norway are people who are able to work, seeking income generating employment at the welfare office (NAV), are available to work and have not had generating income for the past two weeks
Average m^2 Price	The average square meter price in a given post code area
Average Value	The average property value in a given postcode area
Number of Transactions	The number of real-estate transactions recorded in a post code area. Only real-estate deemed to be housing is counted.

Outdoor and indoor environment	Gives the average score of the outdoor and indoor environment questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Relationship between children and adults	Gives the average score of the relationship between children and adults questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
The child's well being	Gives the average score of the The child's well being in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Information	Gives the average score of the information questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers

	to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
The child's development	Gives the average score of the child's development questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Participation	Gives the average score of the participationquestions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Pickup and delivery	Gives the average score of the pickup and delivery questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.

Adaptation and school start	Gives the average score of the adaptation and school start questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Satisfaction	Gives the average score of the overall satisfaction questions in the KPS in Appendix A. The answer possibility "Don't know" is disregarded in the area but counts toward the total number of respondents. An average score for a main area is not calculated if the total number of answers to the questions below is less than the number of questions times five. Figures are not shown for a kindergarten if the response percentage is less than 20. This is calculated as the ratio between the number of invited parents and the number of completed forms.
Number of answers per kindergarten	The total number of parents responding to the KPS. Only one respondent per child is possible. However families with more than one child are allowed one answer per child.
Response rate	The number of respondents to the KPS divided by the number of invited
PE	A facility identified as PE owned for that time period and present in Appendix C
Big4	A facility identified as part of the four largest groups PE owned for that time period and present in Appendix B
Independent	A private facility that is neither PE-owned or part of the largest groups

Public	A facility that is owned by a municipality
Price in Upper Percentile	A postcode area with housing prices in the upper quartile of that county
Price in Lower Percentile	A postcode area with housing prices in the lower quartile of that county
Square Meter Price in Upper Quartile	A postcode area with square meter housing prices in the upper quartile of that county
Square Meter Price in Lower Quartile	A postcode area with square meter housing prices in the lower quartile of that county